AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Volume 69 Number 5

Reg. U. S. Pat. Off.

JULIAN CHASE, Directing Editor

DON BLANCHARD, Editor

P. M. HELDT, Engineering Editor JEROME H. FARRIS, Ass't Editor

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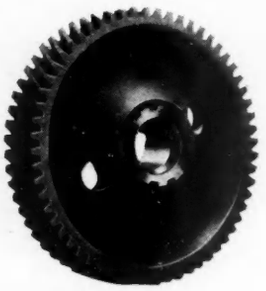
TEXTOLITE TIMING GEARS



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The use of a Textolite timing gear is a token of good manufacture throughout the car.

830-128

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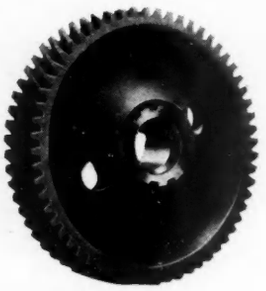

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GENERAL ELECTRIC

AUTOMOTIVE INDUSTRIES

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Parts and Accessory Makers Get Together and Adopt Code

A Super-Association—Automotive Parts and Equipment Manufacturers, Inc.—Organized to function under Recovery Act with other associations cooperating

by

Athel F. Denham

Field Editor, Automotive Industries

WHAT seems like a miracle occurred in the Grand Ballroom of the Book-Cadillac Hotel in Detroit on Monday, July 24, 1933.

Only a short time before that date a thousand or so of the leading manufacturers of equipment and replacement parts, accessories and automotive supplies, were invited to send a representative to a meeting called for the purpose of making a heroic effort to unify the many and diverse interests of the several trade associations in this field with a view to creating one representative organization which should be in a position to formulate a code under the National Industrial Recovery Act and submit it to the administration in Washington.

The proposition, to a large majority of those familiar with the conflict of interests and divergencies of views of those whose interests and affiliations lay with the various groups into which this part of our industry is divided, seemed far across the line between the possible and the impossible. Skepticism prevailed even after the five or six hundred representatives assembled. But the job was done and a new association, to be known as the Automotive Parts & Equipment Manufacturers, Inc., was organized to "broadly represent manufacturers in this part of the automotive industry and to act for them in their relations with the Federal Administration under the National Industrial Recovery Act."

The small group who provided the leadership for this movement were those forming the so-called "Committee on Organization," which was named in last week's issue of *Automotive Industries*. Each is the president of a company to which he is connected. Their names are: Claire L. Barnes, Houdaille-Hershey Corp.; Vincent Bendix, Bendix Aviation Corp.; C. S. Davis, Borg-Warner Corp.; H. F. Harper, Motor Wheel Corp.; A. C. McCord, McCord Radiator & Mfg. Co.; C. D. Minninger, Electric Auto-Lite Co., and C. E. Thompson, Thompson Products, Inc.

To this list should be added other names, first that of C. C. Carlton, Motor Wheel Corp., then those of the dozens of others who gave their time and efforts in the preliminary work, and next, with due and conspicuous credit, the heads of the trade associations who threw their influence behind the movement, even at an unquestioned sacrifice to themselves and their associations. Finally, credit should be given to the entire assemblage at the open meeting, where individual prejudices were buried for the benefit of the industry to make complete cooperation with the National Industrial Recovery Administration possible.

In one short working day of seven hours—a day in which dramatic incidents followed one another with lightning rapidity—order came out of chaos. Personal prejudices were forgotten. A spirit of cooperation replaced hostility.

There has been organized the greatest trade association the indus-

(Turn to page 126, please)

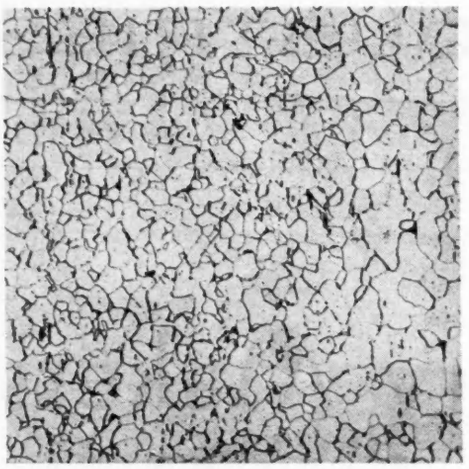


Fig. 1—Typical microstructure of mild-steel deep-drawing sheets

The Aging o

Research throws new light on effects on drawing properties of amount of cold rolling and the subsequent time and temperature of storage

by Dr. Ansen Hayes

THE fact that mild steel ages following local or general cold working has been known for many years. Stromeyer as early as 1891 demonstrated that strips of boiler plate, where they were strained by the shearing action, became brittle when aged at ordinary temperature, and tested by bending at 10 deg. F. He also knew that working steel at a blue heat produced brittleness. In the years following the publication of Stromeyer's paper a number of others were working on the latter phenomenon as well as that of aging. The names of LeChatelier, Charpy, Goerens, and Martens, will go down in history as being responsible for the eary development of this field, for they collected and published a vast amount of information about the methods of testing these properties as well as the results of such tests.

It remained, however, for Fettweiss, in 1919, to demonstrate the fact that aging and blue brittleness are different manifestations of the same phenomenon. This furnished further impetus to investigation and numerous papers have been published on this subject since that time. Dockray discussed the aging of deep drawing steel sheets in a paper presented at the Boston Convention of the American Society for Steel Treating in 1931.

The chemical analysis of steel for modern high finish deep drawing sheets has been fairly well standardized. Practically all sheets of this type are made from rimming steel heats, the ladle tests of which fall within the following range:

Carbon	.04.—10%
Manganese	.25—.45
Phosphorus	Below .04
Sulphur	Below .05
Silicon	Trace

A characteristic microstructure is shown in Fig. 1.

The Rockwell hardness of such sheets may vary within fairly wide limits, depending upon the manner in which they are processed. A range from B-40 to B-55 will cover the Rockwell hardness of most requirements. The tensile properties are perhaps the best means of estimating a sheet's general characteristics, and typical stress-strain curves are shown in Fig. 2. These curves represent material which has been normalized and box-annealed, followed by various

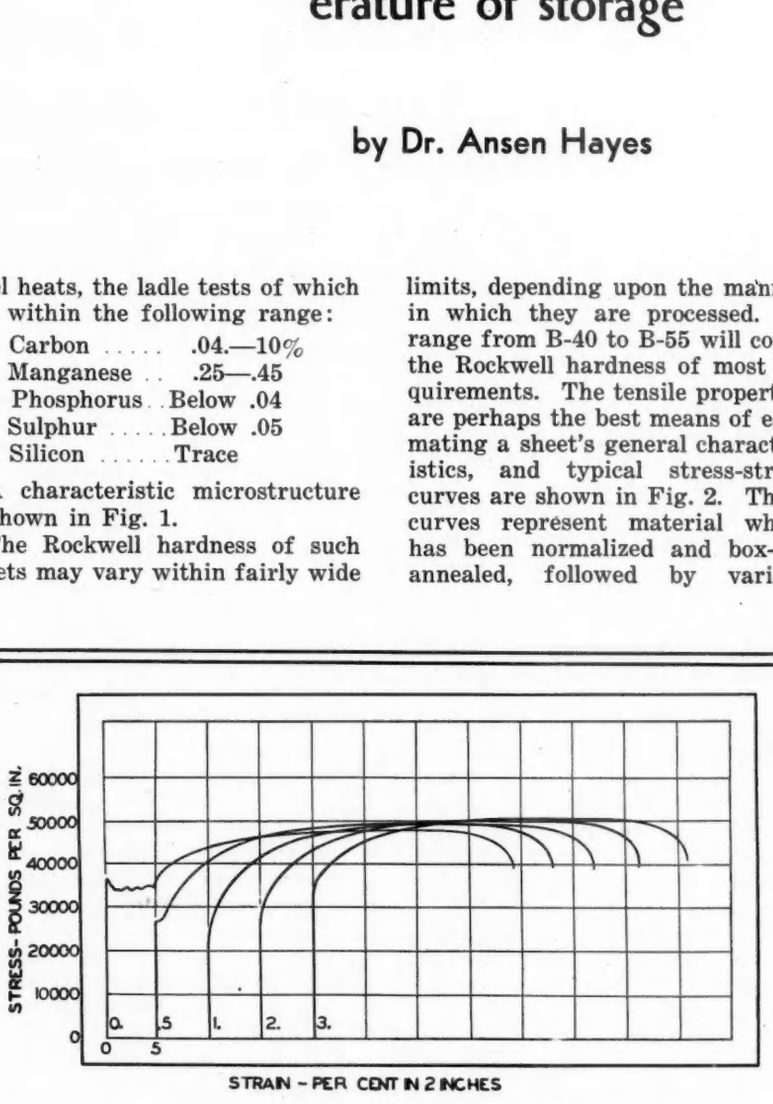


Fig. 2—Stress-strain curves of normalized, box-annealed, mild-steel sheets, temper cold-rolled various amounts and tested while fresh

*From a paper read by Dr. Anson Hayes, director of research laboratories of the American Rolling Mill Company, before the American Iron and Steel Institute in New York.

Mild Steel Sheets*

amounts of temper cold rolling and testing in the fresh condition.

Manufacturers of high-finish deep-drawing steel sheets have realized for many years that aging in the customer's plant has aggravated their breakage and stretcher straining difficulties. It has long been known that the small amount of cold work done by roller leveling will overcome a slight tendency to stretcher strain, but that the effect of this is lost if the sheets are not drawn almost immediately after the leveling operation.

It may be of interest to cite one or two examples of actual experience in the difficulties which aging has caused in the deep drawing sheet industry. In 1927 an interruption occurred in an automobile plant, in the working up of two fairly large lots of material. The sheets drawn while the material was comparatively fresh did not strain. After a delay of several months the remaining portions of both lots strained badly.

A simple and practical test was then arranged to show the relationship between aging and stretcher straining. The drawing job selected was that of a radiator casing, one portion of which received only a shallow draw. Past experience had indicated that this was a severe requirement, for considerable trouble with stretcher strains had been encountered. After a second box-annealing, the sheets for this requirement were placed one sheet at a time in three piles to insure that all variables due to segregation, or other causes, would be the same in each lot. One lot was given a light temper cold rolling, another a medium amount, and a third a rather excessive amount. In order that the "front" and "back" ends of the sheets as rolled could not affect the results in some unknown manner, every other sheet was reversed at the shears, so that the blanks in each set of samples were alternately "fronts" and "backs." One set of blanks, representing three different tempers, was shipped to the customer and drawn in the fresh condition. All three tempers drew equally well, the sheets with even the least temper working satisfactorily without roller leveling. Three months later the second lot was shipped and drawn, and after this aging the sheets with the smallest amount of temper stretcher strained badly. Even after two heavy passes on the roller leveler, two at a time, the strain was so heavy that they were rejected. The sheets with the two greater amounts of temper cold rolling still worked satisfactorily without roller leveling.

Examples such as those cited, indicated the important effect of aging on the drawing performance of mild steel sheets and it was, therefore, deemed advisable to study the effect of certain controllable variables on the course of the changes in the physical properties. Observations of sheet behavior in various drawing shops were complicated by several uncontrollable variables such as differences in dies and presses, lubrication, gage of sheets, variation of sheet properties from lot to lot, etc.

The purpose of the remainder of this paper is to present certain quantitative results of the aging of mild steel sheets. These data should be considered as typical rather than exhaustive.

From practical experience in supplying sheets to the deep drawing trade, it was found that the most important variables in the aging of ordinary commercial mild steel sheets were the amount of cold rolling, and the time and temperature of subsequent storage. In order to study the effect of these three variables, it was necessary to eliminate all the others as completely as possible, and the material selected was, therefore, of a high degree of uniformity from every standpoint, but at the same time representative of the general run of mild steel such as is used for deep drawing purposes.

It has been found that the stress-strain curve, some of which have already been discussed, is a very sensitive indication of the amount of aging which the sheet has un-

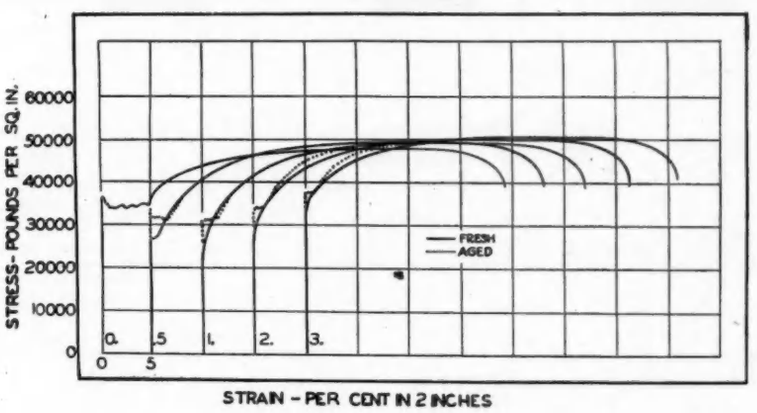


Fig. 3—Stress-strain curves of normalized, box-annealed, mild-steel sheets, temper cold-rolled various amounts. Solid curves represent results from material in fresh condition; dotted curves, results from material aged 10 minutes at 212 deg. F.

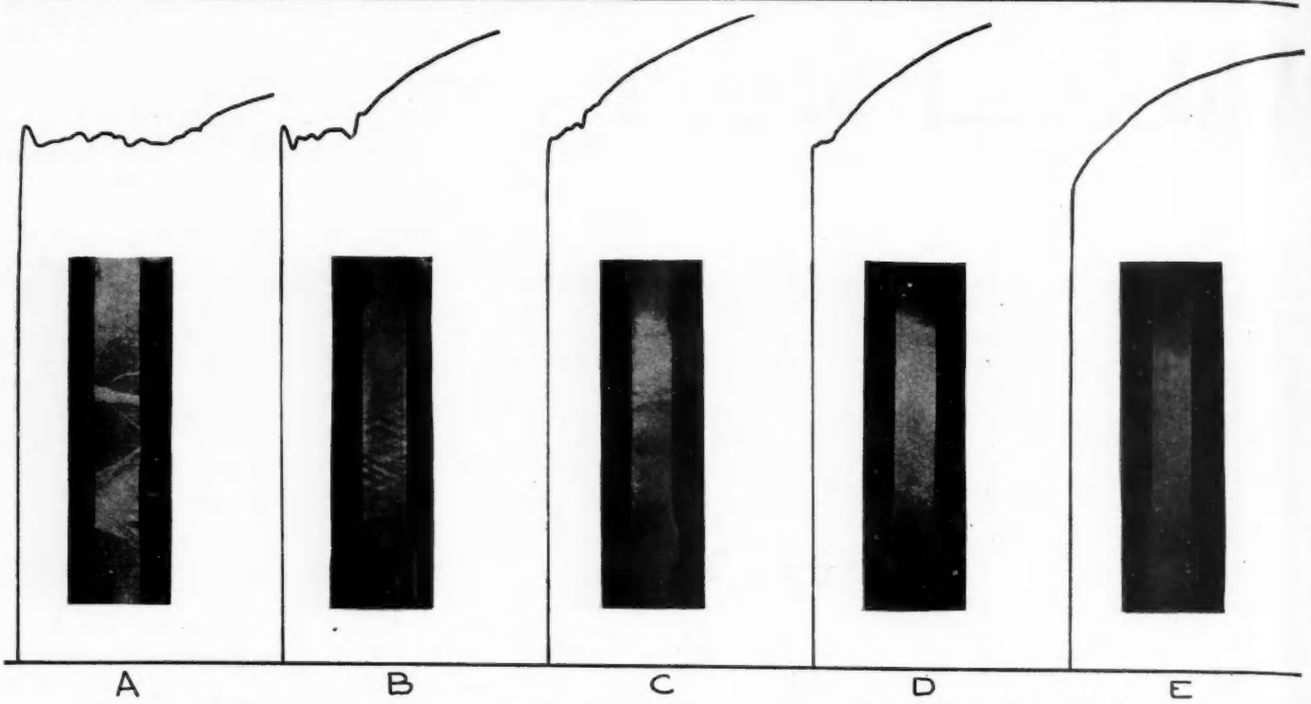


Fig. 4—Stress-strain curves which show different amounts of elongation at the yield point, and surface appearance of test pieces. Yield-point elongations were as follows for the different specimens: A, 9 per cent; B, 3.5 per cent; C, 1.8 per cent; D. 1.0 per cent; E, 0 per cent

dergone. Freshly cold rolled sheets have no sharp yield point and do not stretcher strain, but aging causes a return of both. This is shown in Fig. 3 in which the full lines are for the freshly cold rolled material and the dotted curves are for the same sheets after aging 10 minutes at 212 deg. F. It is seen that the higher the amount of cold rolling the less the elongation at the yield point after aging. The relation between yield point elongation and severity of stretcher strains is shown in Fig. 4.

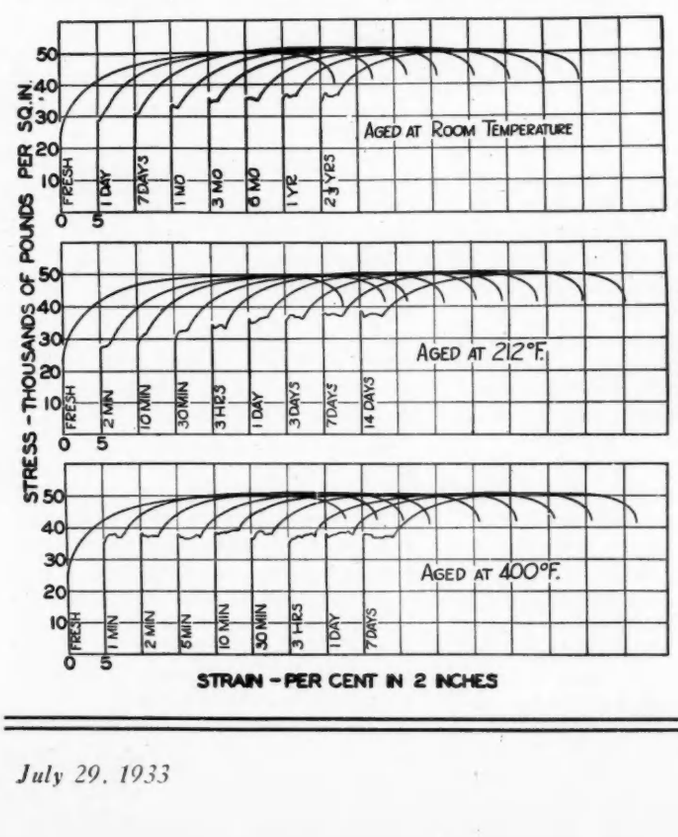


Fig. 5 — Typical stress - strain curves for normalized, box-annealed, mild-steel sheets cold-rolled 1 per cent and aged various lengths of time at the temperatures shown

In order to study the chronological changes in the physical properties of this material, a series of tests was carried out covering the variables of amount of cold rolling and time and temperature of storage mentioned above. Fig. 5 represents typical stress-strain curves for one amount of cold rolling (1 per cent) after aging various lengths of time at each of three temperatures. Several points of interest are brought out by these curves; a rise in yield point and tensile strength occurs, and the length of the curves, which represents the ductility, decreases. At each aging temperature the sharp yield point returns at a time depending on the temperature. The higher the aging temperature the more rapidly the effect takes place.

The progressive increase in yield point elongation with aging can be observed in the above curves but in order to bring this out more clearly

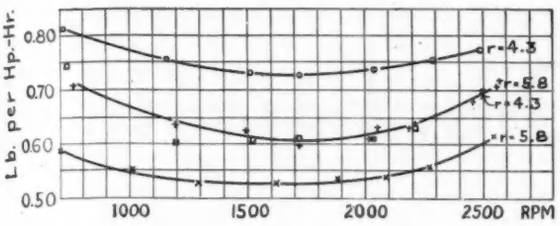


Fig. 1A — Specific fuel consumption curves of 13/40 hp. German Ford with different compression ratios and different carburetor adjustments

high compression. The maximum power output is obtained with a richer mixture, corresponding to about 12 turns of the fuel valve, for both normal and high compression. With this latter adjustment we carried through road tests which made clear the effects of the higher compression as regards more rapid acceleration and reduced consumption. The accompanying table gives the results in detail.

We assume that these results will be of interest to you, as they are of considerable importance in all countries in which anti-knock fuels are widely distributed.

BENZOL-VERBAND,
Bochum, Germany.

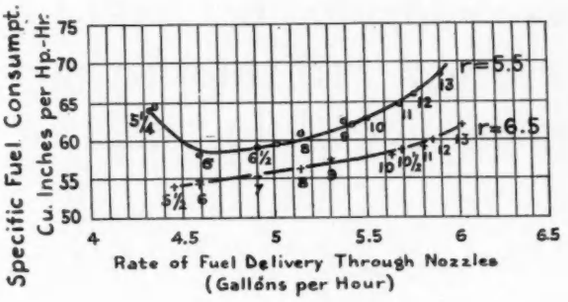


Fig. 2A—Specific fuel consumption (based on hp. at road wheels) of 14/65 hp. German Ford car with different compression ratios and different carburetor adjustments

(Figures underneath the curves signify carburetor adjustment)

view of the availability of anti-knock fuels on the German market. We assume that the "police head" was designed as a result of this suggestion.

It may be of interest to you that our further experiments with the "police head" showed that its compression ratio of only 5.2 gave approximately the same favorable figures for output and consumption as the head we had to use in order to raise the compression ratio of our 8/28 hp. engine. (This is evidently the small-bore European four-cylinder Ford engine. Editor.) In our opinion, this is due to the fact that the "police head" is specially designed for the engine.

In the meantime we have carried through similar experiments with the new Ford eight-cylinder car, in order to take full advantage of our anti-knock fuels. As there is no "police head" for this engine, we ground down the cylinder heads by 0.040 in. and replaced the original 0.060-in. gasket by one of only 0.024-in. thickness, and we were thus able to increase the compression ratio from 5.5 to 6.5. This compression ratio made it possible to save from 8 to 8.5 per cent on the consumption with our German fuels, besides giving an increase in performance, not taking into account the higher calorific value. Fig. 2 shows the output measured at the road wheels and the figures for consumption (related to the former), for various compression ratios and various fuel-valve adjustments, when using our B.V. Aral fuel. These curves show that minimum consumption is obtained with about six turns of the fuel valve, for normal as well as for

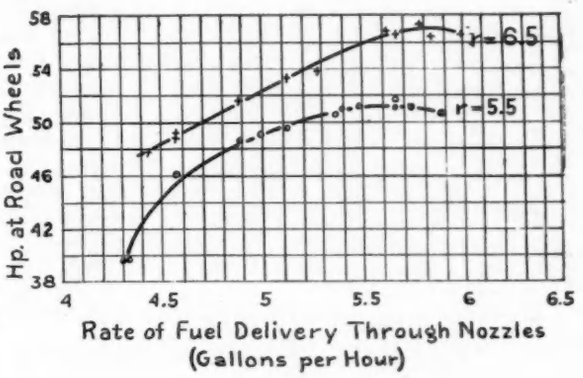


Fig. 2 — Rear-wheel horse-power of 14/65 hp. German Ford with different compression ratios and different carburetor adjustments

Road-Test Results

Fuel-valve adjustment (turns open)	Ignition advance in crank-angle degrees (fixed)	Time of Acceleration from 6.25 to 37.5 m.p.h. (seconds)	Miles per U. S. gallon consumption
	Compression Ratio—5.5		
7	+5	10.4	15.9
8	+5	10.3	17.1
9	+5	10.1	....
10	0	10.2	16.4
	Compression Ratio—6.5		
7	0	10.1	17.4
8	—5	10.0	18.7
9	—5	9.9	....
10	—5	9.7	17.3
11	—5	9.7	....

Finish of 1933 Olds Improved by Ru

Factory Setup for Bonderizing is one of the most efficient and automatically conveys each part through all the steps of the process

IN its line of 1933 models the Oldsmobile Company is giving particular attention to the finish on parts that are the most susceptible to rust.

A check up shows that forty-four sheet metal parts of the 1933 models are Bonderized before enameling. Besides the fenders, such parts as running board housings, hoods, radiator shells and grilles and tire covers—in all, a total of 220 sq. ft. per car of enameled parts is given this rust-proofing treatment.

The factory set-up for Bonderizing was completed just prior to the release of 1933 models and is considered one of the most efficient in the industry. This is due to an entirely automatic system of conveying the parts to be Bonderized from the metal finishing room, through the cleaning and rinse tanks, through the 12,000-gallon Bonderizing tank and the drying ovens. Once the part is placed on the moving conveyor, it is not again removed until it reaches the enameling room.

The speed of the conveyor is adjusted and the equipment sized to give the continuously moving parts the correct timing in the cleaning, rinsing, Bonderizing and drying operations. For instance, it requires five minutes for the material to move through the Bonderizing solution, which is maintained at a thermostatically controlled temperature of 208° F.

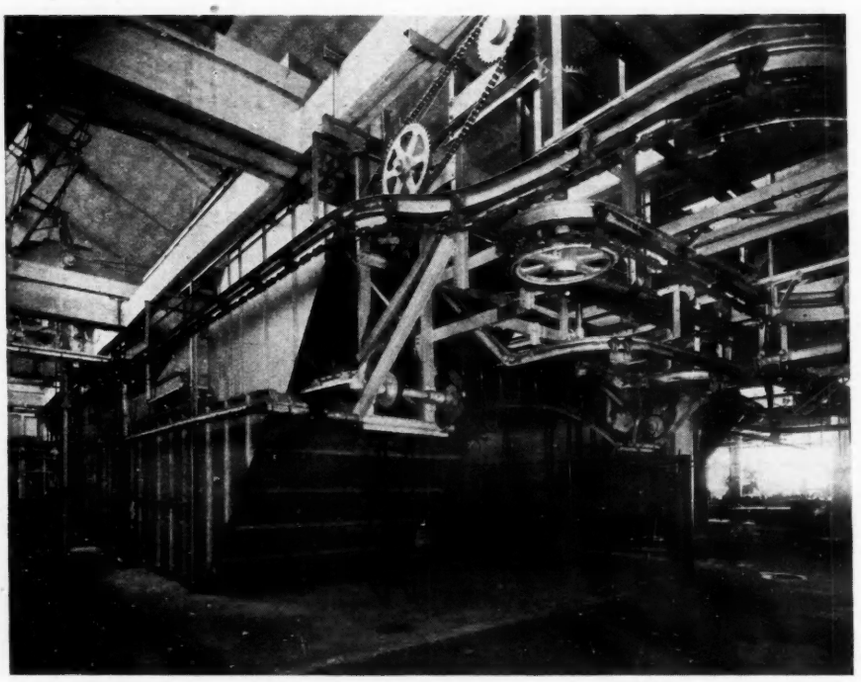


Fig. 1—The receiving end of the new Bonderizing tank, showing a portion of the mechanical handling equipment

The first step in applying fine finishes to automotive sheet metal is the cleaning, and this is accomplished at Oldsmobile in a Barrett washing machine of 1200 gallons capacity, by spraying an alkaline solution on the parts, under 30 pounds pressure, with a temperature of 200° F. Following this, the material passes through two clear hot-water rinse compartments of 1200 gallons each, sprayed at 30 pounds pressure, at a temperature of 160° F. in the first rinse and 130° F. in the second rinse.

As the production emerges from the washing machine, excess water is blown off by compressed air at 80-85 pounds pressure; and, to avoid tarnishing, stains, or water marks, the parts are wiped dry with rags dipped in alcohol.

As the sheet metal moves through the Bonderizing solution, made up of Bonderite powder and water, a microscopically thin portion of the surface metal is changed to a composition that is velvety smooth to the touch, but which is slightly absorbent, so that when the enamel dries, it is securely "keyed" to the metal.

As the material leaves the Bonderizing tank, it passes into another hot-water rinse, then through a hot-air chamber (250°-275°) for drying. The drying chamber is built integral with the Bonderizing tank.

Immediately after the parts leave the hot-air ovens, they are dry wiped with clean cloths, to remove any slight accumulation of dust.

Rust-Proofing 44 Sheet Metal Parts

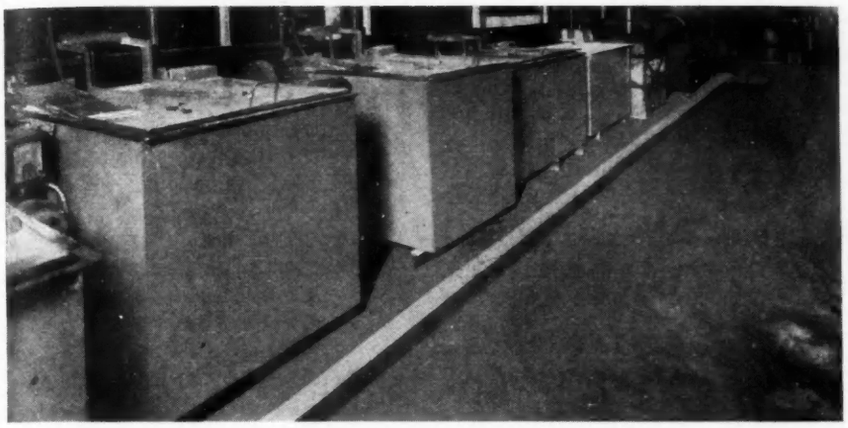


Fig. 2—Solution in Parkerizing tanks is kept just below the boiling point, about 210 deg. F.

The amount of this dust is small, but it is considered good practice to wipe it off thoroughly to assure a better final product. At this point, the parts are transferred to the enameling conveyor or to trucks.

It is found that the Bonderizing treatment is especially desirable for cars being shipped abroad, to offset the effects of the humid, salt atmosphere of a sea voyage, as well as to prevent the rapid deterioration of the finish upon exposure to the weathering to which automobiles are usually subjected.

Another interesting rust-proofing process used extensively by Oldsmobile is Parkerizing. It is applied to 1076 engine and chassis parts, and, in addition to providing a high degree of rust resistance, has other utility features that are important factors in automotive production. The coating set up by this process is of such a character that in many locations it requires only a simple oil finish, no lacquer or enamel being necessary. Being a replacement process, there is nothing deposited on threaded units or close fitting parts to appreciably change the measurements, so that such parts can be treated and still meet the original tolerances set up for the job.

The Oldsmobile set-up for Parkerizing consists of a series of steam-heated tanks in straight line and served by a small overhead monorail crane for lifting the production in and out of the cleaning, rinsing and processing tanks as well as the centrifuge drying equipment.

The routine of this process is simple. The more bulky, cleaned material is immersed in the heated processing solution in wire backets, while small parts such as bolts, nuts, screws, as well as small stampings and castings, are handled in electrically driven tumbling barrels. The temperature of this solution is maintained just below the boiling point, or about 210° F. After rinsing and drying, the material is then dipped momentarily in a black dye and then given a final application of linseed oil, after which the surplus oil is thrown off by centrifuging. The oil saturates the Parkerized coating and, as it oxidizes, provides a further protection against moisture penetrating to the underlying steel.

Only a Trace of CO In Diesel Exhaust

WHEN the advantages of the Diesel engine as a powerplant for road vehicles are enumerated, one point to which attention is usually called is that its exhaust contains much less carbon monoxide than that of the spark-ignition engine, and is therefore non-poisonous. Tests on the subject have been carried out in England recently at the instance of the general manager of the Manchester Omnibus Company. Samples were taken under six different conditions of operation, from engine idling to engine running under full load. Since a Diesel engine always operates with an excess of air, while the opposite usually holds with the gasoline engine, the constituents of atmospheric air (oxygen and nitrogen) were naturally found in considerable greater proportion in the exhaust of the Diesel engine. Under three of the six conditions of operation no carbon monoxide could be detected in the exhaust from the Diesel engine, while under the other three conditions it ranged from 0.1 to 0.2 per cent, while in the case of the gasoline engine there was carbon monoxide in the exhaust under all conditions, the average percentage being 6.1. Nitrogen averaged 81.7 per cent in the exhaust from the Diesel and 78.3 per cent in the exhaust from the gasoline engine; oxygen, 12.7 per cent in the exhaust from the Diesel and 4.6 in the exhaust from the gasoline engine; carbon dioxide, 5.3 per cent in the exhaust from the Diesel and 7.2 per cent in the exhaust from the gasoline engine. Unconsumed fuels in the form of hydrogen and marsh gas were present in considerably greater proportion in the exhaust from the gasoline engine in the tests.

Austro-Daimler Diversifies

HARD times have fallen upon the once prosperous Austrian automobile industry, owing to the inadequacy of its home market and the closure of foreign markets by tariff barriers. U. S. Automotive Trade Commissioner I. H. Taylor reports from Vienna that the Austro-Daimler Works of Wiener Neustadt (about 40 miles south of Vienna, which traces its automobile-manufacturing history back to 1899, finds itself today little if any better off than Steyr, the ranking member of the Austro - Daimler - Steyr - Puch combine, which was financed by the Austrian Credit Anstalt, the financial institution that failed some time ago. During the war period Austro-Daimler added aircraft engine production to that of motor vehicles, and at the peak of its activity it employed some 8000 hands. During the best post-war periods employment approached the 5000 mark. As recently as two years ago the payroll listed around 2000 workers, while today only about 500 are said to be employed, on part time, and most departments are entirely shut down.

Formerly principally engaged in automobile production, this phase of Austro-Daimler's activities has practically ceased. With normal facilities for an annual production of 1000 passenger cars and trucks the 1932 output will total about 150 units. Of these 100 were of the six-wheeler commercial chassis (of which about 75 are said to be unsold), the balance being the eight-cylinder passenger cars and a few of the standard, four-wheel, six-cylinder trucks. Passenger car production was stopped several months ago when factory stocks began to pile up

Approximately 30 per cent of the present Austro-Daimler output comprises motorized rail inspection cars, which are turned out in series of ten units. These cars are subject to numerous design veriations, quite a few having been exported especially to Switzerland where a demand is said to exist for such cars equipped for rail welding. Besides the standard six-cylinder gasoline power plant, the same as used in all Austro-Daimler trucks, a Diesel 16-20 hp. unit was developed for this use. The Bosch-Acro combustion prinsiple is employed and the chief novelty of the engine is that it is air-cooled.

In sharp contrast with curtailed production, the engineering department of Austro-Daimler is busily engaged. As a result of these activities it is expected that 1933 will see the introduction of a 30 hp. (at 1800 r.p.m.) modification of the air-cooled Diesel engine, much lighter than the present job, for installation in a light commercial chassis. Plans for 1934 call for a somewhat similar offering of greater power, for use in heavy trucks. Other developments in prospect include something radically new in automobile drive axles and a hydraulic transmission system.

The success of the Austro-Daimler pneumatic-tired rail bus has attracted the attention of foreign interests. A 32-passenger reversible model is almost ready for delivery to the purchasers of American rights in this latest type transportation unit. Shortly it is anticipated (parts are already being made) to start assembly of 15 of these rail buses. One each is reported sold to Italy and Rumania, a demonstrator is to be sent to Poland, while a firm in England is said to be negotiating for the license. The Austro - Daimler pneumatic - tired railbus is represented in the United States by E. K. Howe & Sons, Inc., of New York.

New Bearing Alloy Designed to Withstand High Temperature

A NEW bearing alloy known as Satco bearing metal has been placed on the market by the National Lead Company, New York. It was developed in the laboratories of one of the company's subsidiaries. It is said to have a higher melting point than the ordinary babbitt metal and to be less brittle, so that it is less subject to failure in case of deficient lubrication. In applying the new bearing alloy to bronze or steel shells, it is recommended that use be made of Satco soldering flux and Satco No. 70 bonding alloy.

Laboratory chill castings of Satco alloy show a Brinell hardness of 27.4 at 20 deg. C., 15.7 at 100 deg. C., and 10.1 at 150 deg. C. these figures being intermediate between corresponding figures for the National Lead Company's Heavy-Pressure and Phenix bearing metals.

In a transverse test on specimens machined from chill castings, 6 in. long, 1 in. wide, and ½ in. thick, the bars being suspended at the ends with a span of 4 in. between supports and the load applied at the middle, the Satco metal specimen showed a transverse strength of 24,285 lb. per sq. in. at failure and a bend of 11.0 deg., while a similar specimen of genuine railroad babbitt showed a transverse strength of 23,770 lb. per sq. in. and a bend of 7.0 deg. The superior toughness of Satco metal and its high resistance to transverse stresses are said to have been borne out by the results of service, in that linings of this metal show no tendency to crack or deform under heavy bearing loads.

Results of comparative compressive tests on Satco metal and the High-Pressure and Phenix alloys are also cited by the company and show that Satco metal is generally intermediate between the two, in connection with which attention is called to the fact that the Heavy-Pressure metal is designed to withstand pressures.

Satco metal ranges considerably higher than both the High-Pressure and Phenix alloys with respect to melting points, the solidification temperature of the former being 563 deg. F. and the complete liquefaction temperature, 788 deg. F.

It is claimed for Satco metal that it casts in all forms and does not shrink away from the mandrel or mold against which it is cast; and that it lends itself to die-casting better than any other of the common white-metal alloys.

Satco metal is already in extensive use in railroad work as a lining for the "brasses" of truck and trailer axles, and it is said to have superior merits for internal combustion engine bearings.

JUST AMONG OURSELVES

Shippers Must Say Their Say

SOME time before Aug. 15 48 directors, one from each state, will meet under the banner of the American Highway Freight Association to go further with final plans for a national federation of truck owners' associations. These 48 directors will represent only the for-hire haulers, but are empowered by the resolution passed at a July 11 meeting to make any changes they may desire in the proposed organization set-up. At the July 11 meeting it was agreed to reorganize the A.H.F.A. to make it representative of the for-hire truck operators.

There is good reason to believe that any code submitted to the National Industrial Recovery Administration relating to trucking will have to represent the views of operators of all types regardless of legal classifications. If this should turn out to be the requirement finally adhered to by NIRA, it is evident that shippers would have to have a voice in any code whch might be expected to get attention and recognition in Washington.

Whatever may be the final status of the motor truck operating industry under NIRA it is probable that the question of motor truck regulation will get attention eventually from the President's Transportation Committee—and there are some evidences that "eventually" may not be very far distant.

Recommendations from this Transportation Committee may be expected to have a strong bearing on action which Congress might take when it reconvenes.

* * *

Food for Thought in Facts and Figures

SOMETIMES we feel as though we spent a good part of our time digesting and interpreting automotive statistics of one kind or another, but we never fail to run across many facts which are interesting when we delve into each new edition of N.A.C.C.'s *Facts and Figures.*

In the 1933 edition which just reached us, for example, we learned that, despite the depression, the amount of livestock hauled by motor truck increased 13.5 per cent last year, while the amount hauled by rail decreased 15 per cent.

The use of solid tires on trucks has almost reached the vanishing point; only 2.9 per cent of the 1932 output was so equipped. This recalled an article we had just read in *Construction Methods* which told about the use of pneumatic tires on earth-moving equipment. On this heavy grading equipment, the article said, "rubber tires have been found to reduce tractor effort, permitting operating at the next higher speed, under equal conditions, as compared with the former steel wheels." It is possible also to move these scrapper units on the highway at high speed on the rubber tire mounting. . . . All of which would seem to indicate that the pneumatic can be used successfully almost anywhere.

But to get back to Facts and Figures, we found the following which might interest others as it did us: Interstate common carrier trucks are 1 per cent of total trucks in use; there is a total highway mileage in the U. S. of 3,040,000 miles, of which 868,000 is surfaced; 90 per cent of all payments for construction of concrete highways is converted into salaries and wages; capital invested in automobile manufacturing (net tangible assets) in 1932 was $1,489,900,000, the peak for this figure having been $2,089,498,325 in 1926, and foreign sales of motor vehicles of U. S. design totaled 181,055 in 1932.

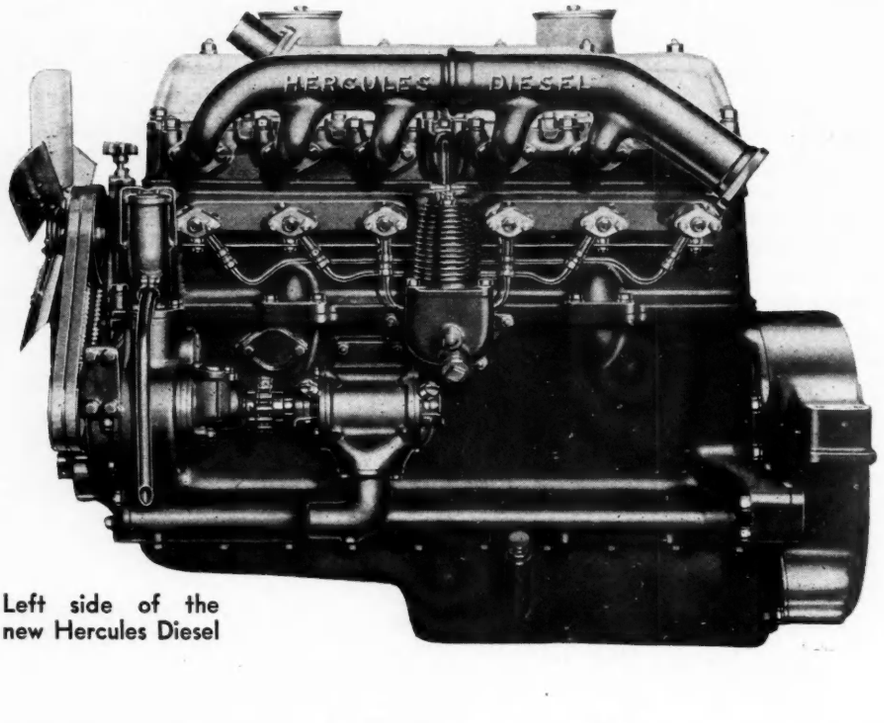
* * *

The Sky's Clear, the Sun Still Shines

THE industry's news continues to record bright spots on the road to business recovery. Gleaned from the mail of one day recently are the encouraging facts that:

General Motors export shipments from U. S. and Canada were 127 per cent greater in June, 1933, than in June, 1932. . . . N.A.C.C. members' production of cars and trucks in the first half of this year exceeded that of the first half of 1932 by 17.6 per cent. . . . There has been an increase of 99 airports and landing fields in the United States since July 1, 1932, the present total being 2136. . . . Plymouth is running the largest July advertising campaign in its history. . . . A gain of 37 per cent was recorded in Australian new car sales in the first quarter of this year as compared to last. —N.G.S.

Hercules Goes In For Diesels with 188 Hp. Six Cylinder Model



Left side of the new Hercules Diesel

HERCULES MOTORS CORPORATION, Canton, Ohio, has entered the Diesel engine field with a six-cylinder solid-injection engine of 5-in. bore and 6-in. stroke for automotive, general industrial, agricultural, oil-field and marine purposes. It is known as the Model DX1, and is designed to be operated at speeds up to 2000 r.p.m.

In general design the engine follows established Hercules practice. The crankshaft is of the underhung type and is supported by the crankcase, which may be of either aluminum or cast iron. It extends 4 in. below the crankshaft axis, forming a deep tubular rib to add to the lateral stiffness. A pressed steel oil pan is bolted to the bottom of the case. The vertical height of the crankcase is sufficient to assure adequate stiffness in the vertical plane. It supports the single cylinder block, to which are secured two cylinder-head castings, each of them covering three of the six cylinders.

"Through" bolts pass through the cylinder heads, cylinder block, crankcase and main-bearing caps, so that all vertical stresses are transferred from the cylinder heads directly to the crankcase. These bolts are provided with eccentric heads located in recesses in the top of crankcase, preventing the bolts from turning when the nuts on the cylinder head or those on the main bearing caps are tightened up. Because of the "through-bolt" construction, all parts above the crankcase can be removed without disturbing the main bearings. Removable liners are provided in the cylinder block, with copper gaskets at the top and rubber ring seals at the bottom. These liners are in contact with the cooling water on the outside.

If preferred, a cast base may be used instead of the pressed-steel oil well, and the bellhousing may be either No. 1, 0 or 00 S.A.E. standard, to suit mounting requirements.

The timing gears are mounted on the end opposite the flywheel, and a trunnion surrounds the crankshaft projection for three-point mounting purposes. A silent chain drive at the front of the camshaft gear drives the fuel pump at half engine speed. The fuel pump is mounted on the right side of the engine below the exhaust manifold, and the fuel delivery tubes lead from the pump to the nozzles on the left side of the engine, passing between the cylinder heads. Either a Bosch or a Compur fuel pump may be installed.

The fan is belt driven from a pulley on the extended drive shaft of the water pump, and when an air compressor is required for brakes or other purposes it is mounted on a bracket attached to the gear cover and driven by the same belt that drives the fan.

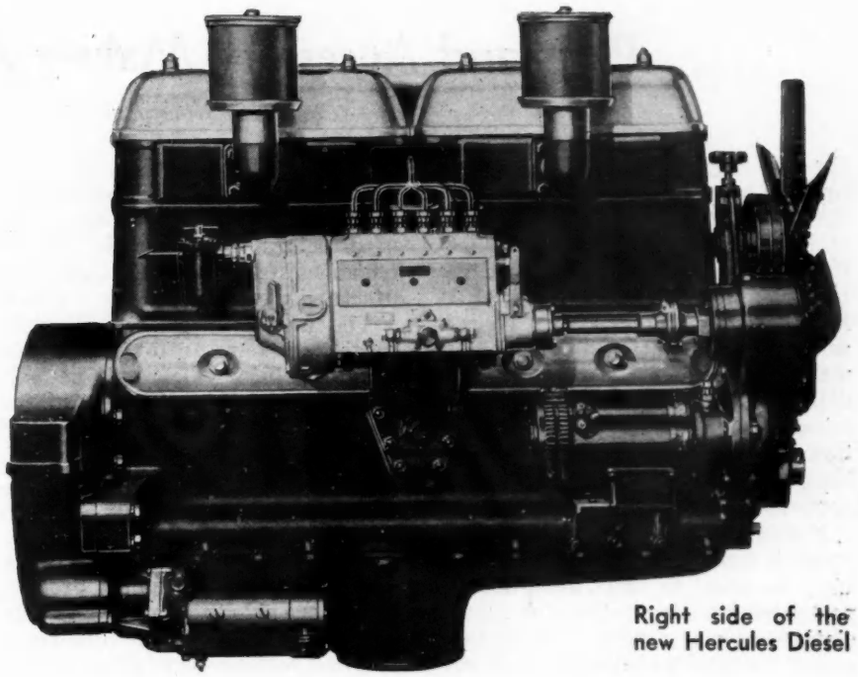
The compressor and water pump are on the inlet or left side of the engine. The water circulating system has been designed to properly direct the cool water to those parts subjected to the extreme temperatures of combustion.

Main and connecting rod bearings are of removable steel shells

lined with a high-lead bronze, capable of carrying high pressures and temperatures. The connecting rod is of H-section design, drop forged and rifle-drilled to carry oil to the piston pin, which is of molybdenum steel, full floating and held in place by aluminum buttons in the piston. Pistons are provided with four compression rings and two oil drain rings each—one oil ring above and one below the piston pin.

The overhead valves are actuated by drop forged rocker arms drilled for valve-stem lubrication and mounted on a hollow hardened and ground shaft held in brackets bolted to the cylinder head. Drilled holes lead oil to these hollow rocker arm shafts for all overhead lubrication, the drain back being around the push rods and back to the crankcase. At the lower ends of the push rods an oil seal is provided to prevent crankcase gasses from entering the valve rocker housing over the cylinder heads. The drain back oil from the rocker arms and valve operating mechanism supplies the oil for the seal, keeping it constantly supplied.

The crankshaft, which is a drop forging of chrome-nickel-molybdenum steel, is of large dimensions and is finished to a high polish on the bearing surfaces. It is drilled for lubrication of the crankpin bearings and provided with an oil seal of Hercules patented design at the flywheel end. An oil thrower seals the forward end of the crankcase, and further protection against loss of oil and ingress of dust and dirt is afforded by a cork-and-felt seal ring clamped in place in the trunnion on the gear cover.



Right side of the new Hercules Diesel

Mounting dimensions are identical with those of the Hercules HX series of gasoline engines.

As regards performance, the company states the engine develops 100 hp. at 1000 r.p.m., 177 hp. at 1800 r.p.m., and 188 hp. at 2000 r.p.m., the corresponding b.m.e.ps. being 110.3, 109.6 and 105.5 lb. per sq. in. The specific fuel consumptions corresponding to these outputs are 0.383, 0.430 and 0.460 lb. per b.hp.-hr. respectively.

Regrinding Connecting Rods on the Cylinder Grinder

AT the request of a prominent air transport company, The Heald Machine Company, Worcester, Mass., has designed a fixture for regrinding master rods on the No. 50 planetary internal grinder.

A relatively small sum invested in a No. 50 machine and two fixtures shown on accompanying photographs, one for cylinders and one for connecting rods will enable those services which do not find it expedient to invest in two separate machines to handle regrinding work in their own shops to advantage.

The connecting-rod fixture is entirely universal, and includes adjustments for centre distance and thickness, as well as a vertical adjustment in addition to the one normally furnished with the machine, so that it will not be necessary to remove the rods from the fixture during the grinding of all the articulating pin holes.

A separate locating plug is furnished for each size of rod. The rod is slipped over this plug, and the V-block slid against the small end of the rod, locating it in the vertical plane. The locking nut is then tightened, and the clamps tightened against the faces of the small end. These are adjustable to take various thicknesses of rod, and care should be exercised in tightening them, not to strain the rod. The C washer is then put on and tightened. The diamond holder can be located in either of the two positions for dressing the wheel for either the articulating pin holes or the piston pin hole.

This fixture is not adaptable to grinding the crank hole, as this will not normally require regrinding.

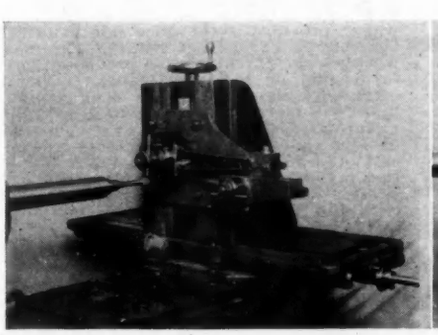


Fig. 1 (Left)—Universal fixture for regrinding articulating pinholes on aircraft connecting rod

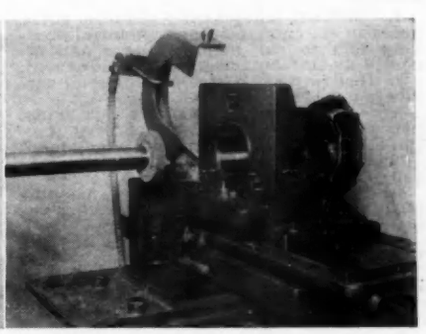


Fig. 2 (Right)—Set-up for regrinding aircraft engine cylinder on Heald grinder, same machine as in Fig. 1

Parts and Accessory Makers Adopt Code

(Continued from page 115)

try has ever seen. Its name and by-laws have been established. Enough applications for membership have been handed in to assure it of success. Its directors have been nominated and elected, and it has thereupon adopted, as a representative association, a complete master code which, except for minor details, is virtually ready for submission to the Federal Administration. Furthermore, machinery has been set up to make the code, when approved, effective in operation.

Membership in the Automotive Parts & Equipment Manufacturers, Inc., is open to any individuals, partnerships, corporations or associations of good repute, actually engaged in the production and/or manufacturer of automotive parts for original equipment and/or replacement of accessories, shop equipment, service tools and automotive chemical products. Each of these groups is to have its own product committee and be represented on the board of directors by its divisional administrator. Membership is subject to approval by the board of directors, except in the case of members of the M.E.M.A. and manufacturing members of the N.S.P.A.

The board of directors (at large), elected pro tem. until the next annual meeting, which will be held during the week of the Chicago Show, are: C. S. Davis, permanent chairman; Vincent Bendix, C. E. Thompson, C. O. Minninger, C. E. Wilson (General Motors Corp.), and Claire L. Barnes.

The divisional directors elected to serve until the various product groups are able to meet individually to elect officers are the following: Original equipment parts, C. C. Carlton, Motor Wheel Corp.; replacement parts, W. G. Hancock, McCord Radiator & Mfg. Co.; accessories, D. S. Brisbin, Columbus McKinnon Chain Co.; service tools, J. H. Williams, J. H. Williams Forging Co.; chemical products, G. W. Sherwin, E. I. duPont de Nemours & Co.

The officers are: President, C. F. Davis; executive vice-president, C. C. Carlton; secretary, G. L. Brunner; treasurer, W. G. Hancock.

The executive committee comprises C. S. Davis, C. C. Carlton, C. H. Wilson, Claire Barnes and J. H. Williams.

Some details in the code, notably the outspoken stand on the open shop policy, may meet opposition, but the association has conferred on the board of directors the power to negotiate with the Federal Administrator regarding the code and will abide by its decision.

A highly interesting provision is an attempted definition of what shall constitute "cost." The code committee realized that unless there was included some definition, no cost accounting system could be evolved or adopted on a comparable basis by the various product groups.

The Code

(Note: Supplementary codes are to be worked out by each product group, but must conform to the master code of the A. P. & E. M.)

Article I—Purpose and Participation. This article follows closely expressions included in Title I of the N.I.R.A. A clause is included stating that one purpose is to effect an immediate reduction and relief of unemployment so that as many as possible of workers NORMALLY ATTACHED to this industry may be restored to payrolls. A further clause states the purpose of restoring income of enterprises to levels avoiding further depletion and destruction of capital assets.

Article II—Definition and division of Industry:

1. Original equipment (includes parts, accessories, equipment and chemical products sold to car manufacturers and included as standard or optional equipment.
2. Replacement parts—including all service parts.
3. Accessories—all parts or equipment not usually included by vehicle manufacturer as standard or optional equipment. Something sold as additional to "standard equipment."
4. Shop equipment. Automotive machine tools and apparatus used in servicing vehicles.
5. Service tools. Including small hand tools.
6. Chemical Products, including finishing or dressing for surfaces, lubricants, anti-freeze, cleaning, polishing compounds, etc.

Article III—Labor provisions. Code reiterates Section VII of the N.I.R.A. with additional clauses proposing to continue the open shop policy, and that no employee and no one seeking employment shall be required as a condition of employment to join ANY union.

Maximum hours 40 per week average for twelve months, 48 hrs. any one week, excepting executives, supervisors, traveling and commission men. Provides that limitations shall not apply on branches where seasonal or peak demands place temporary burden on producers. However in such cases employers must report each calendar month details to the Association. Same provision is made to take care of emergency conditions.

Minimum wage 40 cents per hour unless less than this July 15, 1929. In which case minimum is 30 cents per hour. Casual and incidental labor 80 per cent of minimum wage, provided total does not exceed 5 per cent of payroll per month. Minimum weekly wage $15 with same provision again for casual or incidental labor, learners, office boys and girls (80 per cent of minimum; not more than 5 per cent of payroll).

Not later than 90 days after effective date of code industry will report to Federal Administrator through the Association action taken by all employers in adjusting hourly wage rates for all employees receiving MORE THAN the minimum rates.

No person under 16 years of age shall be employed.

Employer located in a section where lower minimum wage has been prescribed in another industry's code shall have right to employ men in same crafts and classifications of labor at such lower prevailing rates.

Nothing in the Master Code shall prevent Product Groups from setting individually higher wages or shorter hours in their individual codes.

Article IV—Unfair Competition. It shall be unfair competition to:

1. Sell his products below a reasonable cost. Here will follow a definition of what constitutes "cost." Uniform cost accounting system to be adopted by each product group for its members.
2. Cash or trade discounts, freight, express, cartage, etc., to be deducted in figuring net sales price.
3. Clean-up sales permitted providing previous reports of stocks and prices to move such stocks are made to product group. Here follow other more general items of what constitutes "unfair competition," also a clause against interpretation or application of code to promote monopolies, discriminate against small enterprises, etc.

Article V—Administration.

The Association is constituted as agency for carrying out provisions of the code. (It is reported that General Johnson has already expressed his willingness to work with the association.) Other details are covered under the association itself, in this article.

Article VI—General. Provisions for changes in code by Board of Directors without consulting membership, with approval of President of United States. Provision that if any item of the code is declared invalid or unenforceable other provisions of the code will not be affected.

Violation of any code provisions shall be deemed unfair competition and make offender liable to penalties imposed by the NIRA.

Code to be effective 10 days after approval by the President.

The fourth of a series of articles dealing with some of the fundamental problems underlying the design of automatic speed changing devices to meet the conflicting and changing requirements of operation

by P. M. Heldt
Engineering Editor
Automotive Industries

AUTOMATIC TRANSMISSIONS

Rear-Axle Torque Load as a Transmission Ratio Control

CONTROL of the transmission ratio by the torque on the driven member (rear-axle torque load) has been used in most of the automatic, infinitely-variable transmissions that have been developed in the past. The transmission is then held by a spring or springs in a position giving a low ratio of reduction, and as the resisting torque increases the torque reaction overcomes the springs and changes the setting so as to increase the ratio.

In the de Lavaud transmission, for instance, there is a wobble plate on the propeller shaft, from which motion is transmitted to the rear axle by means of links and roller ratchets. The "plate" does not rotate but is mounted on anti-friction bearings on a rotating hub whose geometrical axis makes an angle with its axis of rotation. Rotation of this hub through its connection to the propeller shaft causes the plate to wobble and the link rods, which connect from it to the outer members of the roller ratchets, to reciprocate, this reciprocating motion being converted into rotary motion of the rear axle by the roller ratchets. The inclination of the rotating hub relative to its axis of rotation determines the strokes of the link rods. This inclination is variable and is determined by balance between the spring pressure and the reaction on the link rods. When the resisting torque on the rear axle is light the spring washers force the hub into the position of maximum inclination. This results in the maximum stroke of the link rods and in maximum rotary speed of the axle for a given engine speed.

As the resistance to motion of the car increases the greater reaction of the links on the wobble plate reduces the angularity of the latter, compressing the springs, thereby reducing the stroke of the link rods and the speed of rotation of the rear axle relative to that of the engine. In the terminology of "stepped" transmissions, the car is then running in a lower gear.

With a transmission of this type, car and engine characteristics somewhat similar to those plotted in Fig. 2 may be obtained. On the horizontal axis are plotted rear-axle torques in lb.-ft. per 1000 lb. of car weight. The maximum value of the scale, 400 lb.-ft. per 1000

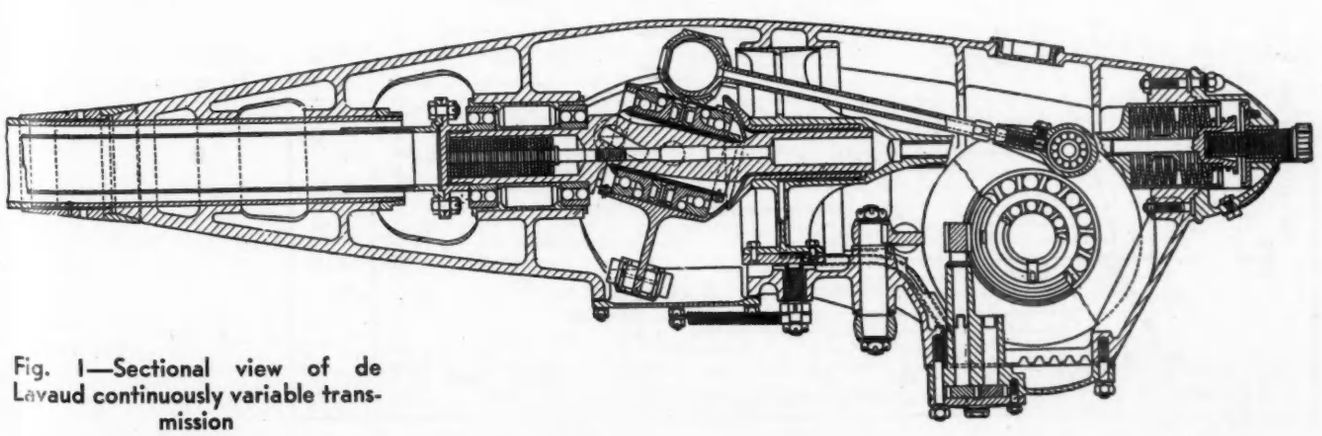


Fig. 1—Sectional view of de Lavaud continuously variable transmission

lb. of car weight, was chosen because it gives approximately 9 ft. p.s.p.s. acceleration on a good level road, which is probably enough for a car in which there is no interruption in the torque during the period of acceleration. The minimum transmission ratio is shown to be 3 to 1, and this is assumed to remain constant until the car attains a speed of about 60 m.p.h. At this speed, if the proportion between air resistance and traction resistance is as usual, the rear-axle torque required will be about 105 lb.-ft. per 1000 lb. Therefore, with a 3 to 1 ratio the net engine torque will be 35 lb.-ft., and allowing 15 per cent for transmission loss the gross engine torque will be 41 lb.-ft. per 1000 lb. of car weight.

At a rear-axle torque of 105 lb.-ft. the transmission ratio begins to increase, and it seems rational to let it increase at such a rate that the engine torque remains constant and the increase in rear-axle torque is due entirely to the increase in ratio. The net engine torque being 35 lb.-ft. for a rear-axle torque of 350 lb.-ft. we evidently need a ratio of 10 to 1. If the torque reaction were taken on ordinary coiled springs or any other type in which there is a straight-line relation between deflection and load, then the ratio would vary uniformly with the rear axle torque and we would get a graph of the transmission ratio by drawing a straight line through the points in the chart representing a ratio of 3 for a rear-axle torque of 105 lb.-ft. and a ratio of 10 for a rear-axle torque of 350 lb.-ft. The cupped type of spring washer, as used in the de Lavaud transmission, does not follow a straight-line law and the change of ratio with torque therefor could not be represented by a straight line.

Maximum rear-axle torques would be developed only in acceleration and on very steep grades. When the car is being driven on the level with the throttle fully open, the torque developed on the rear axle is only about one-third the absolute maximum obtainable, the same as with the ordinary shift-gear transmission. As change of ratio begins only with a rear-axle torque of 105 lb.-ft. the automatic transmission control plays only a minor part in driving on the level, the change in ratio starting only at 60 m.p.h. The reason for not arranging for a change in ratio at a lower speed is that with a roller ratchet transmission from crankshaft to propeller shaft it would be quite impossible to obtain a steady drive if the ratio were lower than 3, and this is even too low for practical purposes. To gain the full benefit of the continuously variable gear it would probably be necessary to use an over-drive in combination with it. But even a 3 to 1 ratio in use on level roads at all steady speeds up to 60 m.p.h. would be quite an advantage over the usual ratios of 4.3-4.6 to 1, as used in small cars.

The curved line on the left-hand side in Fig. 2 represents the car speed corresponding to the rear-axle torque scale on the horizontal axis. With 30-in. driving wheels a rear-axle torque of 25 lb.-ft. per 1000 lb. of car weight is required at the lowest speeds, and the torque increases with increase in speed, owing to the increase in air resistance. Up to the 60 m.p.h. point the same curve also represents the engine speed, owing to the fact that up to this point the transmission ratio remains constant. From that point on, however, the engine speed increases much faster than the car speed, owing to the simultaneous increase in the transmission ratio, as indicated by the dashed line shooting off from the car-speed curve at the 60-m.p.h. point.

The sort of power curve obtained with the arrangement described is illustrated in Fig. 3. The lower curve represents the horsepower required for the propulsion of the car on level road. The upper curve shows the horsepower available at the rear axle at the different speeds with a constant reduction ratio of 4, the engine being of such capacity as to give the car a maximum speed of 70 m.p.h. It will be seen that up to a very high speed there is a large excess power, which means, of course, that if the car is being operated at these intermediate speeds the engine is only lightly loaded and is therefore operating quite uneconomically. The intermediate curve shows the horsepower available at the rear axle with a reduction ratio which remains constant at 3 to 1 up to a speed of 60 m.p.h. and then increases uniformly with the torque,

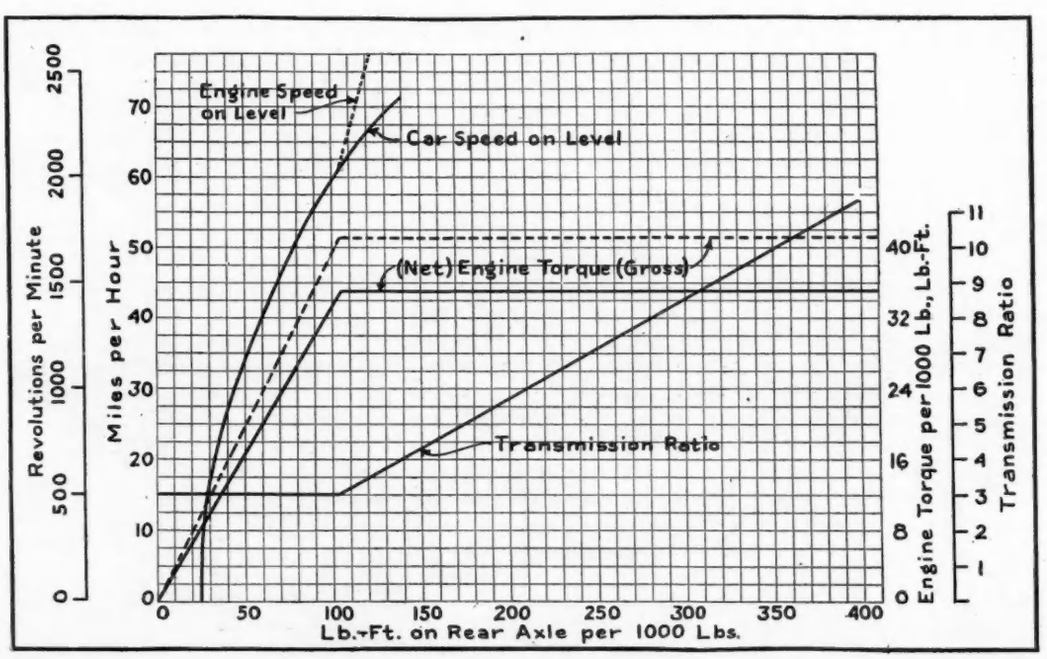


Fig. 2—Relation between rear-axle torque load and transmission ratio

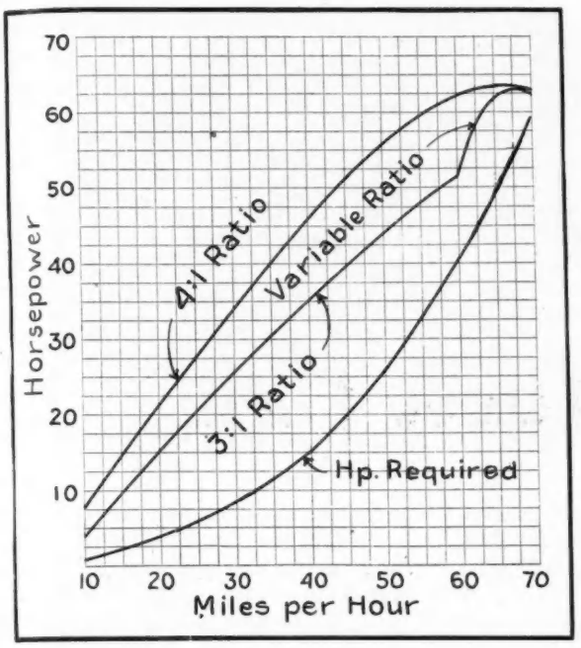


Fig. 3—Curves of horsepower required — and horsepower available

attaining a value of 4 to 1 for a speed of about 71 m.p.h. It will be seen that with this transmission the engine is loaded much closer to capacity through the greater part of its speed range, which increases the economy of operation. The intermediate curve points only to the case of a steady running and the vertical distance between it and the horsepower-required curve therefore does not measure the reserve for acceleration, as in the case of a fixed gear ratio. If the throttle is opened quickly while the car is running at moderate speed, the rear axle torque will be greatly increased instantly and this will lead to an increase in the reduction ratio. Hence the objection that there is danger of stalling the engine when running too close to the limit does not apply in this case.

In the Constantinesco torque converter, Fig. 4, there are a pair of oscillating weights carried at the ends of the long arms of double-armed levers which are fulcrumed on crankpins on the power shaft (the engine crankshaft). The short arms of these double-armed levers connect through links to rocking levers which impart motion to the rear axle through roller ratchets. If we assume that the car is anchored in place, so that the driving axle cannot turn, then the pivot connection of the link with the double armed lever serves as a fulcrum for the lever and the weight is oscillated with maximum amplitude by the engine crank. Owing to the inertia of the masses at the ends of the long lever arm, a considerable force—periodic in nature—is exerted on the links. This force, of course, tends to turn the rear axle, and if the resistance to motion of the car is reduced, as by releasing the brakes, the links begin to reciprocate, with the result that the actual motion of the masses is reduced. For a given engine speed, the force exerted at the end of the short arm of the double-armed levers is greatest if the masses oscillate through the maximum range; that is, if the rear axle is locked and the torque resistance on it therefore is virtually infinite. As long as the torque produced on the rear axle by the oscillation of the inertia masses exceeds the resisting torque, the car will be accelerated. Increase in the speed of the car for a given engine speed involves a greater "throw" of the links, and therefore a smaller movement of the inertia masses. Therefore, as the car speed increases, the torque on the axle, which is dependent upon the amplitude of oscillation of the inertia masses and the frequency of such oscillation (engine speed) decreases. If the engine is idled the torque is insufficient to move the car, even though the inertia masses then oscillate through their maximum range. The car is started by speeding up the engine and stopped by taking the foot off the accelerator.

The Constantinesco car had a minimum reduction ratio in the torque converter of 5 to 1, and this is probably about the smallest ratio which can be obtained with a roller-ratchet mechanism in a practical way. The ratio virtually becomes infinite as the stroke of the links is reduced to zero.

The transmission automatically accommodates itself to varying road conditions. Suppose, for instance, that a hill is being approached at considerable speed, the throttle being wide open. As the car speed is great, the torque is comparatively light, which means that the inertia masses oscillate with only a small amplitude. The first effect of the increasing resistance due to the hill is that the car speed decreases. At first the engine speed also decreases nearly in proportion to the car speed, but as the car slows down further and the throw of the links decreases in consequence, the engine speeds up again. If the grade is a uniform one, a condition of equilibrium will be reached where both the engine and driving axle turn at uniform speeds.

All mechanical transmissions of the continuously-variable type embody a roller ratchet or equivalent device which transmits one stroke of a reciprocating motion. These roller ratchets transmit motion in one direction only, and cars equipped with them therefore are free-wheeling. The question has been raised whether cars equipped with such transmissions, without any means of preventing the free-wheeling action, would be allowed on the highways, as certain States have laws prohibiting the use of non-locking free-wheeling units.

Control of the transmission ratio by the rear-axle torque load seems

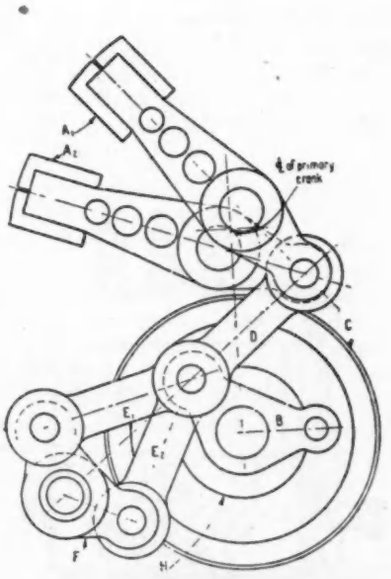


Fig. 4—Diagram of Constantinesco inertia-type transmission

to have a good many advantages. It keeps the reduction ratio low as long as conditions are such that the engine can handle the load through a small ratio, which makes for maximum fuel and oil economy, smoothness of engine operation and minimum wear and tear. The ratio is automatically increased not only when the traction resistance increases due to soft roads or grades, but also when the throttle is opened quickly for acceleration. The application of this principle of control to continuously variable transmissions has been solved by a number of inventors, but these transmissions involve certain objectionable features. So far this principle of control does not seem to have been applied to stepped transmissions, though it would seem to have advantages there too. One condition of its successful application here would seem to be a very quiet shift on hills to prevent loss of momentum.

Bosch Feed Pump for Heavy Fuels

IN vehicles equipped with Diesel engines the fuel supply tank often is located below the level of the injection pump, so that a special feed pump is required to supply fuel to the injection pump. Bosch injection pumps for Diesel engines, as illustrated in Fig. 1, are now fitted with a feed pump which is operated directly from the camshaft of the injection pump.

Owing to variations in the rate of fuel consumption of Diesel engines, and particularly of automotive-type Diesels, the feed pump must deliver fuel at a variable rate, suited to the consumption of the engine. In the Bosch pump, therefore, the plunger is so arranged that it does not have to follow the operating member positively, but may remain behind. The stroke of the feed pump plunger thus varies with the amount of fuel required per cycle. The mode of operation of the pump is illustrated in Figs. 2, 3 and 4. If the consumption remained constant it would suffice to deliver fuel by the up-stroke of the plunger through delivery valve 6 into line 5. However, if the injection pump delivered to the engine only a part of the fuel supplied to it, there would soon be an intolerably high pressure in line 5. This is prevented by the provision of a passage 4 between fuel line 5 and space 3 below the plunger of the feed pump. The effect of this passage is as follows:

With the actuating cam 1 (a cam of the injection pump) in the position shown in Fig. 2, plunger 11, which has been forced down by spring 7, has drawn fuel from suction line 9 into chamber 10. At the same time it forced the fuel in chamber 3 through passage 4 and line 5 to the injection pump. During the following lift of cam 1, the plunger is raised again and fuel is forced through delivery valve 6 and passage 4 into space 3, as shown in Fig. 3. During this stroke there is therefore merely a transfer of fuel from 10 by way of 6 and 4 to 3, since this passage offers the least resistance to the fuel. When the cam descends again the plunger follows the tappet under the influence of spring 7 and delivers fuel through passage 4 and line 5 to the injection pump. If the injection pump does not require the whole amount of the fuel contained the plunger forces only so much fuel to the injection pump as is required to establish equilibrim between the line pressure and spring 7. The plunger does not remain in contact with the tappet during the downstroke and performs a stroke which is dependent upon the pressure in line 5, that is, on the fuel requirements of the engine.

The method of fuel feed described has the further advantage that it is impossible for air to get into chamber 3 through the tappet guide of the pump, since this chamber is continually under pressure. Oil leakage through the tappet guide is said to be very small, because the diameter of the tappet is small.

The pump will lift the fuel up to 6 ft. The maximum normal speed is 1000 r.p.m., but the speed can be increased to 1800 r.p.m. for short periods.

A fuel filter is always combined with the feed pump and is so installed that its outlet is somewhat higher than the fuel connection to the injection pump. This produces a siphon action when the engine is first started, so that fuel is delivered to the injection pump from the beginning.

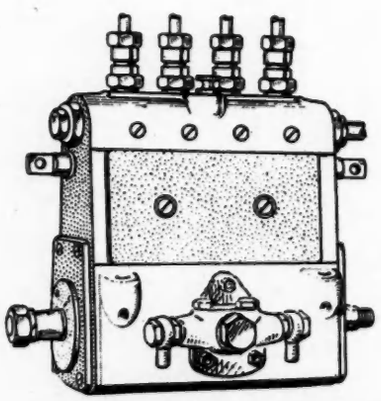
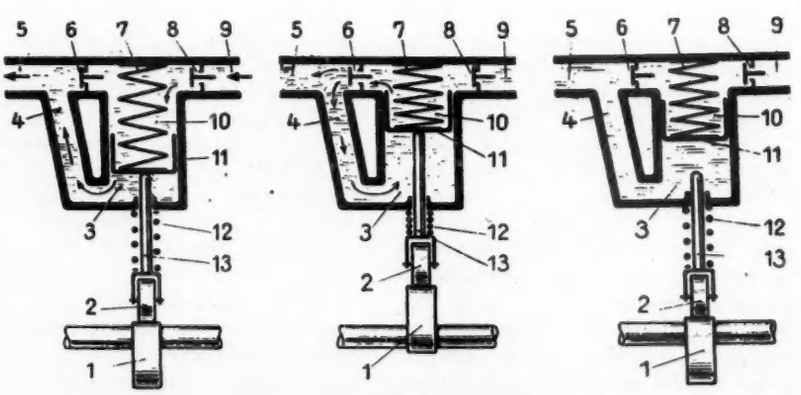
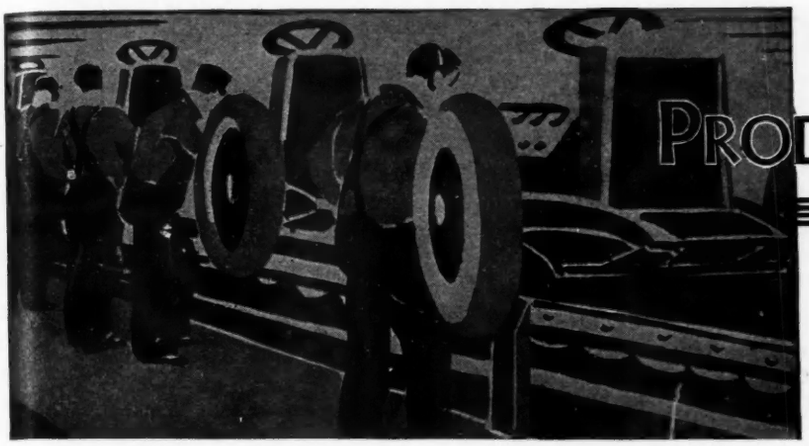


Fig. 1—Bosch injection pump with in-built field pump



Figs. 2, 3 and 4—Diagrams of Bosch feed pump



PRODUCTION LINES

Get Ready

Got an interesting piece of direct mail the other day from a manufacturer of presses and shears. It tells production executives how important it is to check up on the condition of knives for squaring shears. Are they ready? Reground, keen, sharp? The idea can be extended to every piece of equipment in the shop. Now is the time to modernize, clean up, and make ready.

To the Last

"Yes," said the specialist, as he stood at the bedside of the sick purchasing agent, "I can cure you."

"What will it cost?" asked the sick man faintly.

"Five hundred dollars."

"You will have to shade your price a little," replied the purchasing agent, "I had a better bid from the undertaker."—From *Marquette Lubricator* for June.

Higher Education

Glad to learn that Landis Tool had two foremen groups taking conference training last year through the extension department of Penn State College. One group of 17 took an elementary course while another of 19 is now taking advanced instruction. Pennsylvania concerns certainly have taken the initiative in this direction.

Expand Alloys

Fourteen typical nickel steels for castings were described by A. G. Zima of International Nickel, at the annual meeting of the American Foundrymen's Association. Among these are alloys for highly ductile steels, moderate cost steels said to be superior to carbon steels, abrasion resistant castings, and castings possessing strength and creep resistance at elevated temperatures.

Ford Adopts

Ford News for June announces that a synthetic resin base enamel has been placed in regular production on the entire line. The finish has been used for three years for commercial bodies and colored wheels, the field experience thus gained proving the suitability of the new material for volume production. Ford's move opens a new field for the synthetic resin finishes which have been under development in recent years.

5 x 10^8 Cycles

Endurance limit of light alloys of aluminum is of the order of 500 million cycles of stress, according to R. L. Templin. Other fatigue data based on recent research forms the basis for Templin's paper, "The Fatigue Properties of Light Metals and Alloys," which was read at the last annual meeting of the A.S.T.M.

Cuts Curing

Preheating pellets of phenolic compounds in extrusion molding is said to cut the cure time in half on many jobs. The preheat occurs in the temperature range of 150 to 180 deg. F. A tip from "Molding Reminders" in the *Durez Molder* for July, 1933.

What is It?

This query about Bakelite is answered in a little vest pocket booklet just published by the Bakelite Corp. How bakelite is made, with some highlights of the chemistry of the process, also a discussion of the six forms in which the material is commercially available. A fine reference for quick reading on a basic product that's going places.

World's Largest

Timken joins the roster of the "world's largest" with a roller bearing that weighs 3½ tons (7000 lb.) It is said to have a capacity of 8,000,000 lb. and is intended for roll neck service in steel mills. See it at the Century of Progress Exposition.

Controls Impact

An A.S.T.M. paper on the current knowledge in the field of impact testing described a method for determining the impact resistance of hard metals such as hardened tool steels. The new method already has been instrumental in obtaining a better understanding of the treatment of tools steels and promises to give reliable data hitherto unavailable. Should be of interest to everyone concerned with metal cutting.

For Extremes

Electric furnace colloidal graphite as a high temperature lubricant is described in Technical Bulletin No. 130.6, issued by the Acheson Oildag Co. It has been subjected to temperatures around 1300 deg. F. in the atmosphere of annealing furnaces. Recommended among other things for enameling furnace chains, die casting machines, utilizing old dies, etc.

15 Saved 150

A saving of $150 for an outlay of $15 is the experience of a foundry. A riser in a nickel, semi-steel casting that had been nicked and flogged off carried with it a part of the casting. The hole left by this accident was refilled by means of the blowpipe, using a welding rod of composition similar to the base material, thus reclaiming an otherwise good casting.—From *Oxy-Acetylene Tips* for July, 1933.

—J. G.

MANUFACTURING MANAGEMENT METALLURGY

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Two-Spindle Machine Provides Precision

A G&L No. 35-F horizontal boring machine has been added to the line of high power precision horizontal boring, drilling and milling machines manufactured by the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

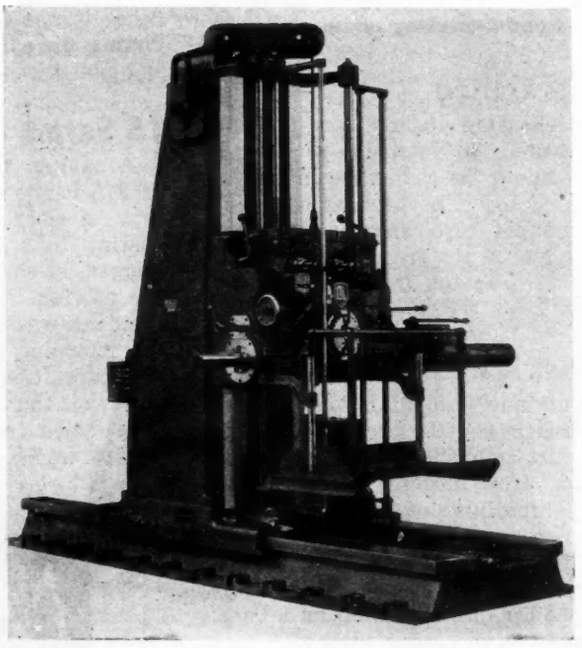
On a column of massive proportions is mounted a two-spindle head providing a main spindle of 3½ in. diameter, running up to 500 r.p.m., and a high-speed auxiliary spindle with a speed range up to 1500 r.p.m. The auxiliary spindle permits the drilling or precision boring of even the smallest holes or using the smallest end mills. The main spindle for larger boring, milling and drilling operations is carried by entirely independent bearings so that the original precision alignment is never impaired. Each spindle has 36 speeds and 18 feeds, arranged in fine geometrical progression. All speed changes are accomplished by means of sliding gears and jaw clutches through three levers conveniently located at the front of the head. A selecting lever permits the engagement of one or the other spindle. This same lever also controls the application of the feed to either spindle.

Eighteen feeds are controlled through two levers with a third for direction. Slow hand feed is applicable to either spindle through handwheel at front of head. An automatic trip is also provided for automatically throwing out the feed at any predetermined depth within 6 in. spindle travel. Pick-off gears are incorporated in the feed train so that practically any range of feeds or any particular feed is obtainable.

A separate milling feed unit for 18 feeds with directional control is built into the spindle head, permitting the head to feed up or down on column, or the column to feed back and forth on runway in the same direction as the respective lever is shifted either by feed or rapid traverse. The speeds and feeds applying at any time to spindle or milling units are shown on direct-reading dials. Hand feed adjustment is also provided.

Powerful clamping arrangements are provided for clamping spindle head to column and column to runway. The operation of the entire machine is conveniently controlled by the operator standing on a telescoping platform. All parts are automatically lubricated.

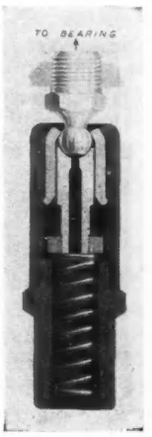
The motor is placed at bottom of column on adjustable bracket. Bails are provided at top of column so the machine can be moved wherever needed.



G & L No. 35-F horizontal boring machine

New Alemite Fitting Allows Higher Pressure

A new type of connection between lubricator fittings and grease gun has been developed by the Alemite Division of the Stewart-Warner Corporation, which makes it possible to apply much higher pressures to the lubricant than with previous systems, without danger of leakage. The new system is known as the Alemite hydraulic lubricating system. It embodies the good points of both the original bayonet-type of connection and the later "push-type," but permits of higher pressures on the lubricant than either of these systems.



Ball-tip lubricator fitting and adapter which makes it possible to use present grease guns with the new fittings

Referring to the sectional view herewith, the new style connection grasps the ball point of the fitting with a light spring grip when contact is first made, and with a vice-like grip when pressure is applied to the grease. A small piston in the outlet tube, forced forward by the pressure of the grease, moves three steel jaws forward into the tapering tips of the outlet tube, forcing them to close firmly around the ball-tip fitting. The higher the pressure on the grease the tighter the grasp of the connector on the fitting.

With the push-type of connector the limit of effective pressure was about 5,000 lb. per sq. in., because at higher pressures it was impossible for the operator to maintain the contact. With the new fittings and mechanically-operated systems, the pressure can be boosted to its limit of 8,000 lb. per sq. in. This increase in operating pressure is said to be more than enough to force the lubricant through clogged bearings that could not be cleared with the older type of connection.

In a comparative test of the old

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

and new styles of fittings and hand-operated guns, working against an hydraulic pressure gage, it was found that the maximum pressure obtainable with the old bayonet-type of fitting was 2,000 lb. per sq. in.; that obtainable with the push-type of coupling, 3,500 lb. per sq. in., and that with the new hydraulic system, 11,000 lb. per sq. in.

Grease guns designed for use with the push-type of fitting work just as well with the new ball-point fittings. This has made it possible for eight car makers to change over to the ball-point fittings without waiting for their dealers and service stations to get new lubricating equipment to fit them. Present forms of lubricating equipment can be changed over to suit the hydraulic fittings by means of an adapter with a quick-acting connection.

Gettner Universal Striper

A striping tool for automobile bodies and other purposes has been announced by the K. H. Gettner Shop of Detroit. It comprises a precision grooved wheel mounted in a housing. When the tool is pressed against the work, the wheel recedes, thereby opening a valve which allows paint to flow to the wheel. The wheel is said to carry the paint to the surface to be striped in a uniform manner, and deposits it thereon. The paint is carried in an aluminum cup with a vent hole in the cover which is closed when the tool is not in operation.

The guide for this striper is of unusual construction. There is only one thumb nut to tighten when the guide is adjusted up and down, in and out, to take any type of automobile molding or flat surface. The two members which guide the tool on the molding or straight edge are ball-bearing, so as not to mar the finish of the surface being striped. The guide swivels as a whole, so that the operator can stripe from above or below the molding.

Gettner universal striper

We understand that this striping tool has been adopted by one of the largest automobile plants in the world for regular production. For production works fixed guides are used, built for the particular job, while for refinishing and miscellaneous work a universal guide is furnished.

Propeller Control on New Boeing Plane

A new type of Boeing transport plane placed in service by United Air Lines is equipped with Pratt & Whitney Wasp engines fitted with Hamilton controllable-pitch propellers. This equipment has made it possible to lower the gross weight to 13,100 lb. and bring the cruising speed up to 171 m.p.h. This cruising speed corresponds to three-quarters engine power at an altitude of 5000 ft. The plane is said to take off in 740 ft., to land at a speed of 58 m.p.h., and to have a rate of climb of 1320 ft. per min. With a fuel capacity of 273 gal. of gasoline, it has a cruising radius of 750 miles. A contract for sixty of these transports was placed with Boeing by United Air Lines, and the last thirty of them to be delivered will have controllable-pitch propellers.

Hold-Downs Adjust for Metal Thickness

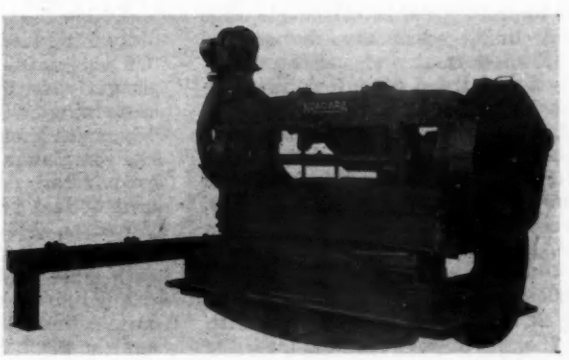
To meet the demands for shearing heavy plate, the Niagara Machine & Tool Works, Buffalo, N. Y., has developed the M Series Shears of heavy-duty construction.

An outstanding feature of the machine is the independent chuck carrying the lower knife which permits permanent location of the bed and facilitates adjustment for proper knife alignment.

The box section crosshead carrying the upper knife is counterbalanced with air cylinders mounted in the crown. These cylinders directly connected to the regular shop air-line operate with practically no loss of air in that the down-stroke forces the air back into the line.

Another feature is the patented hold-down, each foot of which is arranged with an individual spring cushion. The feet are self-adjusting for different thicknesses of material, building up pressure as the thickness of material increases. Sheets of shorter length than the maximum cutting length of the shear are gripped with uniformity without tilting the hold-down. The shear may be used for cutting full capacity plate at one end and light gage plate at the other in the same stroke.

A powerful jaw clutch with hardened tool steel inserts on both striking and backlash surfaces drives the main shaft. The operator trips the clutch mechanism by means of the foot bar conveniently located in front of the shear and unless the foot bar is held in a depressed position, the main shaft will make one revolution and stop at the top of the stroke.



Niagara heavy-duty shears

June Output of 260,645 Puts Industry 15% Ahead of First Six Months in 1932

Industry has best Month since May, 1931, as Production Gains 37 per cent on June of last year and 15 per cent over May of this year.

WASHINGTON, D. C.—June production of passenger cars and trucks in the United States and Canada amounted to 260,645, according to the Census Bureau. This is the largest monthly total since May, 1931, and represents a gain of 37.0 per cent over June, 1932, when production was 190,218. The increase over the May, 1933, total of 227,699 is 14.5 per cent.

The rapid increase in production has brought the total for the first six months of 1933 to 1,045,372, a gain of 14.8 per cent, as compared with the total of 911,117 for the similar period of 1932. This increase has been due to the expansion in the production of both passenger cars and trucks, with cars recording a gain of 15.5 per cent over last year for this period and trucks a gain of 11.7 per cent.

June production of passenger cars totaled 217,488 against 166,646 last year, a gain of 30.3 per cent. As compared with May, 1933, when 192,722 cars were produced, this represents an increase of 12.8 per cent. Production of commercial vehicles totaled 43,157, a gain of 83.3 per cent over last year and 23.3 per cent over May, 1933.

Canadian production of cars and trucks for June totaled 7323, as compared with 7112 in June, 1932, and 9396 in May, 1933. Of the month's output 6005 were cars and 1318 trucks. For the first six months of 1933 a total of 38,262 cars and trucks were produced in Canada, as compared with 39,669 for the same period last year.

Motor Vehicle Production in 1933
(U. S. and Canada)

	1933		
	Cars	Trucks	Total
June	217,488	43,157	260,645
May	192,722	34,977	227,699
6 months	882,093	163,279	1,045,372
	1932		
	Cars	Trucks	Total
June	166,646	23,572	190,218
May	165,025	27,451	192,516
6 months	764,790	146,327	911,117
Percentage gain 1933 over 1932			
	Cars	Trucks	Total
June	30.3	83.3	37.0
May	16.8	27.1	18.2
June over May	12.8	23.3	14.5
6 months	15.5	11.7	14.8

Subnormal Seasonal Effect Helps Sales Upward Trend

Closing Week May Give Exceptionally Good Record for Month of July

DETROIT—Although reports show considerable variation in sales trends for different car manufacturers, there is a great deal of evidence pointing to the fact that the seasonal sales peak has been passed for the time being. July retail sales, from reports so far available, indicate a 10-15 per cent drop from June. The closing week or ten days, which of late, have been the most active in every month may improve record. Although sales are declining seasonally, the drop is less than normal and indicates that the general trend of automobile buying with seasonal variations eliminated, is still upward.

Individual company reports follow:

Plymouth production for July is estimated at from 30,000 to 32,000, representing 20 per cent drop from June, but 350 per cent increase over last July.

DeSoto shipments for week ending July 22 totalled 936, compared with 860 the previous week and 184 for the same week last year. DeSoto sales were 552 as compared with 445 the week of July 15 and 395 the same week last year.

Graham Paige reports orders from dealers for the first 24 days of July more than double the total for same period in June. Shipments expected to exceed June totals.

Cadillac reports sales running approximately 50 per cent ahead of last year with the second 10 days of July showing an increase of 74 per cent.

Hudson-Essex sales on July 15 were 193 per cent ahead of corresponding period last year. For the first half of July sales ran about 10 per cent ahead of June.

Dodge dealers for the week ending July 15th made 4926 retail deliveries. Of this total, 2305 units were passenger cars, 625 were trucks and the remaining 1996 represented sales of Plymouth sixes by Dodge dealers.

From January 1st to July 15th, this year retail deliveries are 209.8 per cent of last year's for Dodge passenger cars, 136.2 per cent for Dodge trucks and 149.8 per cent for Plymouth sixes sold by Dodge dealers.

For the week ending July 22, Dodge cars delivered at retail totaled 2717 against 2305 for the preceding week.

NEW

Ford Suggests Using Railroads More

Drive-Aways To Be Limited to 200 Miles. Other Shipments By Rail or Water

DETROIT—The diversion of a greater percentage of car and truck shipments to the railroads is under consideration and apparently advocated by the Ford Motor Co. While some of the larger automobile manufacturers have, in a general way, accepted the belief that some of the highway traffic in deliveries should be turned over to the railroads, the Ford organization is probably the first one to offer definite aid to the railroads in this manner.

According to present understanding, the Ford Co. plans to use car-carrying trucks only within a radius of about 200 miles. Shipments at greater distance will go by rail. The move is expected to result not only in benefit to the railroads but also to a definite decrease in highway traffic congestion. It is felt, too, that the products delivered over the longer distances by railroads will reach the hands of the buyers in better condition.

Smith Resigns from Stewart-Warner Corp.

CHICAGO—C. B. Smith resigned yesterday as president and executive committee member of the Stewart-Warner Corporation. The office of president is to be left open for the present. J. E. Otis, Jr., a vice-president, was named executive vice-president at a meeting of the board. Mr. Otis will also sit with the executive committee.

The corporation reported net loss for the June quarter of $155,315 after taxes and all charges, as compared with net loss of $691,802 in the preceding three-month period and net loss of $487,173 in the second quarter of 1932. For the first half of this year, net loss was $847,117 against $1,023,933 in the six months ended June 30, 1932.

WS

Steel Companies Show Improved Statements

Net Earnings Better Largely Because of Automotive Buying

NEW YORK—The continued improvement in steel operations is reflected in the financial statements of various steel companies for the first half of 1933 as compared with the same period of 1932, and for the second quarter of 1933 as compared with the first quarter.

United States Steel Corporation

Myron C. Taylor, chairman of the board of directors of the U. S. Steel Corporation, reports marked improvement in their operations. For the current month, Mr. Taylor said, operations would average about 53 per cent of capacity, against 36.1 per cent in June, 25.7 per cent in May and 20.4 per cent in April. This increase in operations has cut their net loss after deduction of taxes, interest, de-

(*Turn to page* 138, *please*)

Tire Prices Up 10%, Third Rise Since April

AKRON — Prices of automobile tires and tubes were increased another 10 per cent effective July 26 by all the rubber manufacturers of the Akron area.

The United States Rubber Co. took the lead this time in announcing the price boost. Goodyear, Goodrich, Firestone, General and a half-dozen smaller companies here followed with practically identical statements.

This marked the third increase in tire prices since April 1, but according to statements of factory executives here still leaves tires cheaper than they were selling in September, 1931, and much below the 1926 level of prices on similar makes of tires. Another price increase of considerable size is predicted if commodity prices in general are raised to the 1926 level in accordance with present reconstruction plans of the government.

N.A.C.C. Agrees on Wage Increase But Fails to Draw Up Code.

Majority of Members Favor Filing Code Upon Securing Signatures of Sufficient Percentage of Industry.

DETROIT—*Automotive Industries'* prediction last week that no code would be adopted by car manufacturers this week was borne out today when members of the N.A.C.C. and Ford Motor Company failed to agree as to the terms of a code, after receiving a report from the board of directors based in turn on a report turned in by the special code committee headed by Donaldson Brown. The official statement from the N.A.C.C. following the meeting follows:

"Factory wage workers employed in the plants of members of the National Automobile Chamber of Commerce would receive an increase in the rate of pay on or about August 1 under the terms of a resolution recommending such action and passed unanimously by the group in its meeting today." It is estimated that more than 200,000 workers come directly under this resolution. While no final action was taken, it was the sense of a substantial majority of members that a code should be filed with the National Industrial Recovery Administration as soon as signatures representing a sufficient percentage of the industry could be secured.

Commenting upon the proposed wage increases, Alvan Macauley, president of the Chamber, said:

"The action of the members of the National Automobile Chamber of Commerce in recommending increases to workers was taken today as an earnest and sincere desire to cooperate in every way with the President in reestablishing purchasing power. Throughout all the years of their activity the leaders of the automotive industry have been advocates of the highest wages consistent with such economics."

2nd Quarter G.M. Earnings Up 800%

Improved Conditions Shown in Preliminary Report Sales Best Since 1931

NEW YORK—The preliminary report of General Motors Corp. for the quarter ended June 30 showed net earnings, after all charges and deductions for taxes, amounting to $41,198,169. This compares with net earnings of $6,870,007 for the first quarter and $5,326,377 for the second quarter of this year.

The net income for the first six months of 1933 was $48,068,176, which is equivalent to $1.01 a share on common stock after preferred dividend requirements. This net is more than three times that for the first half of last year.

It was pointed out by Alfred P. Sloan, Jr., president of the corporation, that the report does not provide for any losses on cash balances in closed banks as these losses are not determinable at this time. On June 30 these balances amounted to $13,837,443. United States Government and other marketable securities and cash not including balances in closed banks amounted to $200,488,763, which compares with $172,780,695 on Dec. 31 and $215,897,767 on June 30 of last year.

The net working capital on June 30 was $259,499,831 exclusive of balances in closed banks.

For the six months ended June 30, 1933, General Motors dealers in the United States delivered to consumers 399,764 cars and trucks, compared with 345,574 cars and trucks in the corresponding period of 1932—a gain of 54,190 units, or 15.7 per cent. Sales to dealers in the United States during this period amounted to 427,762 cars and trucks, compared with 341,751 cars and trucks in the first six months of 1932—a gain of 86,011 units, or 25.2 per cent. Total sales to dealers, including Canadian sales and overseas shipments, amounted to 498,622 cars and trucks, compared with 394,915 cars and trucks in the corresponding period of 1932—a gain of 103,707 units, or 26.3 per cent.

du Pont Increases Working Capital

NEW YORK—An increase $15,420,530 in working capital is shown in the statement of E. I. duPont de Nemours Co. for the first half of 1933. Current assets were increased by $18,075,354, and current liabilities by $2,655,184 for the period. There is also shown an increase of total assets from $595,486,070 to $599,139,145. The surplus on June 30 amounted to $168,514,200 as against $178,717,374 at the close of 1932. During the second quarter of this year surplus was increased $4,023,149.

The earnings for the first half year amounted to $11,277,500 or $1.03 per share which includes dividends from General Motors.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

Despite the disturbance of the sharp breaks on the security and commodity markets, there were increasing evidences of business gains throughout the country last week. Operations in the steel industry continued to make a good showing, with activity now above the 1930 level. Employment continued to increase, and further wage advances were reported. Retail sales were higher, especially in rural sections, where early crops have been marketed.

Freight Loadings Reach New Peak

Railway freight loadings during the week ended July 15 amounted to 648,206 cars, the highest for any week so far this year. The total marked an increase of 108,983 cars above those during the preceding week, an increase of 144,445 cars above those a year ago, but a decrease of 109,783 cars below those two years ago.

Retail Sales Quiet

Department store sales in the metropolitan area of New York during the first half of July were 4.1 per cent below those in the corresponding period last year.

Business Failures Decline

Business failures in the United States continue to decline, both in number and in the amount of liabilities involved. According to Dun & Bradstreet, Inc., commercial failures during June numbered 1648, as against 1909 during the preceding month. The current figure is the lowest for any month in the last four years. The liabilities involved amounted to $35,344,-909, as against $47,971,573 in May and $76,931,452 a year ago.

Power Production Still Up

Production of electricity by the electric light and power industry of the United States during the week ended July 15 was 16.4 per cent above that in the corresponding period last year.

Life Insurance Drops

Sales of ordinary life insurance during the first half of this year were 79 per cent of the value of those in the corresponding period last year. June sales, however, reflected some improvement, totaling 88 per cent of those in June, 1932.

Fisher's Index

Professor Fisher's index of wholesale commodity prices during the week ended July 22 stood at 70.4, as against 68.8 the week before and 66.6 two weeks before.

Stocks Break

The New York Stock Exchange last week suffered one of the most drastic breaks in its history. The sharp declines in prices on Wednesday, Thursday and Friday were paralleled only by the collapse of the market in the autumn of 1929. Trading was on an exceptionally large scale, totaling more than nine and a half million shares on Friday. Practically all issues showed net losses for the week, some of them very large. Sharp breaks also occurred on the commodity markets.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended July 19 showed decreases of $5,000,000 in holdings of discounted bills and of $3,000,000 in holdings of bills bought in the open market. Holdings of government securities increased $10,000,000. The reserve ratio on June 19 was 68.4 per cent, the same as a week and two weeks earlier.

De Paolo with Reo for Safety Campaign

LANSING—Pete De Paolo, internationally famous racing driver, holder for seven years of the Indianapolis Speedway 500 mile record, dubbed "Knight of Speed" by Mussolini, has been employed by the Reo Motor Car Company to conduct a public safety campaign. He is now visiting city, county, and state officials, and Reo distributors on the Pacific Coast and making public demonstrations to emphasize the importance of careful driving and the hazards of some of the more common forms of carelessness. He will talk also before schools and societies.

Taxing of Motorists Checked Says A.P.I.

Work of Committee Has Helped to Prevent New Gas Taxes in Many States

NEW YORK—The whip of public opinion brought into play throughout the nation during 1933 has driven back the tax raiders who have made motorists their favorite prey, according to a review of legislative events made by the American Petroleum Industries Committee. That committee launched less than a year ago by the American Petroleum Institute has worked through state committees wherever legislative bodies have been in session, with the result that legislators have been convinced that already a disproportionate share of the cost of Government is being taken out of the automobile gasoline tank.

The central committee conducted a vigorous defensive campaign in Washington before Congress, and succeeded in holding to ¾ cent a gallon the proposal to increase the federal gasoline tax by 1 cent. Likewise the committee, working with other agencies, was enabled to forestall legislation intended to compel the American motorists to use an alcohol-blend motor fuel and set up a Government subsidy for the manufacture of alcohol.

So far this year only one state raised gasoline tax rates—Oregon, which increased the tax to 5 from 4 cents.

Alcohol Bills Killed

Bills imposing a tax upon gasoline unless it contains alcohol were defeated in Iowa, Minnesota, and South Dakota. Defeat also was obtained for an administration measure calling for a "flexible tax" in West Virginia. Municipalities of Iowa were denied the right to tax gasoline for local revenue purposes. Bills providing for taxes upon fuel oil were defeated in Maine, Vermont, and Washington.

The 1-cent city gasoline tax imposed by Palatka, Fla., was removed July 1.

Efforts to prevent diversion of gasoline tax funds from roads continued without interruption in all states where such measures were introduced. Proposed diversion of $17,000,000 in California was defeated at a special election June 27. Operation of New Mexico's lubricating oil tax of 4 cents per gallon to finance free school books was suspended pending a referendum at the next general election.

Petroleum products were exempted from taxation under new sales-tax laws enacted in Oklahoma, New York, Minnesota, and Vermont. Measures to tax retail sales of tangible personal property were defeated in Florida, Georgia, Maine, Michigan, and Texas. Gross income sales taxes were defeated in Connecticut and Iowa.

Terraplane to Be Equipped With Radio

Special generator prevents battery exhaustion through continuous use of the radio on the Terraplane deLuxe. This is the sedan of the line

DETROIT—It is announced by the Hudson Motor Car Co., that Terraplane Six and Eight Cylinder deLuxe Models will appear with radios installed as standard equipment. This announcement is made by the Grigsby-Gruno Co., makers of Majestic radio sets. At the present time all Hudson and Essex cars are wired for radio.

Graham Exports Ahead in First Half

DETROIT—Robert C. Graham, executive vice-president, Graham-Paige Motors Corp., has announced that export business during the first half of 1933 was one-third ahead of the corresponding period last year. During the first six months of the current year Graham shipped 540 units abroad, as against 405 units in 1932.

France, Switzerland, Holland and Spain all showed increases. Mexico also reported increased business while indications were that South American buying would begin soon. In the Far East Australia was the only country in which increased motor car buying was in evidence.

Budd Companies Make Better Showing

PHILADELPHIA — After depreciation, taxes and other charges, for the six months ending June 30 a net loss of $303,550 was shown by the E. G. Budd Mfg. Co. against a net loss of $854,487 in the first six months of 1932. For the second quarter, after deduction of charges, a net profit of $93,938, equal to $1.48 a share on 7 per cent preferred stock, was shown. This contrasts with a net loss of $397,488 in preceding quarter and $313,141 in the second quarter of last year.

The Budd Wheel Co. for six months ending June 30 showed a net loss, after depreciation, taxes, etc., of $287,083 as compared with $643,030 in the same period in 1932. For this Budd organization the second quarter of 1933 gave a net profit, after charges, of $16,036 as against a loss of $192,864 in the corresponding quarter of last year.

Payne Rejoins Greenfield T. & D.

GREENFIELD, MASS. — The Greenfield Tap and Die Corporation of Greenfield, Mass., has announced that Col. Frederick H. Payne, who disposed of his interests in the corporation in 1929 and became the Assistant Secretary of War, has rejoined the corporation as chairman of the board of directors.

Colonel Payne and associates recently purchased a large block of the common stock from interests who had been in control of the corporation since 1929.

Mr. Charles N. Stoddard, who continues as president and general manager, will, with the board of directors, nine of whom are residents of Greenfield, direct the affairs of the corporation in the future.

Wages and Employment Boosted in New Jersey

TRENTON, N. J.—According to a statement made by Col. Charles R. Blunt, Commissioner of Labor, employment in the State of New Jersey showed an increase of 5.7 per cent during the month of June over May. During the same period payrolls increased 8.1 per cent and average weekly earnings 2.4 per cent.

Edsel Ford Director of New Detroit Bank

Manufacturers National to Merge Three Suburban Banks With R.F.C. Assistance

DETROIT—A charter for the new Manufacturers National Bank is expected within a week and the officers and directors have been announced with the approval of the Controller of Currency.

John Ballantyne is to be president. He was formerly chairman of the First National Bank of this city and president of the Detroit Bankers Co. Henry H. Sanger is to be vice-president and cashier and was president of the National Bank of Commerce.

Among the directors approved are Edsel B. Ford and Clifford B. Longley, attorney for the Ford Motor Co.

The Manufacturers National Bank is a new institution with a capitalization of $5,250,000 fully subscribed, and will merge the Highland Park State Bank and the Peoples Wayne County Bank of Highland Park and the Guardian State Bank and the Dearborn State Bank of Dearborn. On the assets of these suburban banks, which are all functioning on a 100 per cent basis, the Reconstruction Finance Corporation will advance $17,000,000.

The new institution will be the medium of disbursing a further 20 per cent to depositors of the closed Guardian National Bank. This will be made possible by a loan of $25,000,000 from the Reconstrtuction Finance Corporation.

AC Production in June Ahead of 1929

FLINT, MICH.—During June 1933 the AC Spark Plug Co. produced more units than it did in June 1929. The dollar value of June 1933 sales was 104 per cent over that of June 1932 and 20 per cent ahead of May of this year. As might be expected there was a corresponding improvement in employment and wages and, according to reports from company executives, it is expected that this level will be maintained in July.

Machine Tool Makers Vote Not to Exhibit

CLEVELAND—At a recent meeting of the board of directors of the National Machine Tool Builders' Ass'n., it was agreed that the best interests of all members of the machine tool industry would be served by an adherence to the spirit and letter of the exposition rules as adopted in 1930. It was decided that no sanction would be granted for the exhibit of machine tools by members of the association at a number of exhibitions scheduled for this fall.

Steel Companies Show Improved Statements

(*Continued from page* 135)

preciation, etc., from $16,730,271 in the first quarter of 1933 to $8,627,367 in the second quarter and from $33,670,722, for the first half of 1932, to $25,357,638 for the same period in 1933.

Inland Steel Company

Reports a net loss for the first six months of 1933 of $986,292 as compared with $1,440,523 for the same period in 1932, and a net income of $25,761 for the second quarter of 1933 as against a net loss of $1,012,053 in the preceding quarter.

Jones & Laughlin Steel Corporation

Their financial statement shows a net loss of $3,743,446 for the first half of 1933 as compared with a net loss of $4,509,940 in 1932, and a net loss of $1,682,801 for the second quarter of 1933 as against $2,060,645 in the first quarter of 1933.

Midland Steel Products Company

The net loss of $275,085 for the first half of 1932 has been changed into a net income of $278,896 for the same period in 1933, and the second quarter of 1933 shows a net income of $341,800 in contrast with a net loss of $135,950 for the like period of 1932.

Otis Steel Company

For the first six months ended June 30: Net loss of $957,624 compared with net loss of $1,340,170 in the first half of 1932. Quarter ended June 30, shows a net loss of $257,253 as against $700,371 loss for the first quarter of the year.

Republic Steel Corporation

A loss of $2,929,019 is shown for the first half of this year as compared with $5,221,118 for the same period last year. For the quarter ended June 30, they report a loss of $407,451 in contrast to the loss of $2,521,568 in the preceding quarter and $2,744,826 loss in the second quarter of 1932.

All figures shown above are after deduction of fixed charges such as interest, taxes, depreciation, etc.

Rusco Goes in for Canadian Expansion

ST. JOHNS, QUE.—All looms at the St. Johns plant of the Russell Manufacturing Company, Ltd., makers of Rusco brake linings and other automotive products, are being rearranged to permit the installation of additional equipment. F. A. Gerrard, manager of the Replacements Department stated today, "Our business has far exceeded our expectations and we feel that these improvements will enable us to render better service to our customers. The present increase is a healthy growth as most jobbers' stocks have been reduced to a minimum."

Federal Mogul Makes Profit in First Half

DETROIT — The Federal Mogul Corporation reports a net profit for the six months ending June 30, of $9,321, after deduction of depreciation, taxes and other charges. This is in contrast to a net loss of $63,793 for the same period last year.

Gemmer Shows a Six Months' Profit

DETROIT—The Gemmer Manufacturing Company shows a net profit of $16,003 after fixed charges, for the first six months of this year as compared with a net loss for the same period last year of $53,211.

Bendix Aviation Makes $549,386 at Mid Year

SOUTH BEND—Bendix Aviation Corporation and subsidiaries report a net profit after fixed charges for the first six months of $549,386 contrasted with a net loss of $52,126 last year. For the quarter ending June 30, they show a net profit of $816,849 against net loss of $267,463 in the preceding quarter and $78,490 in the second quarter of 1932.

Automotive Wholesalers Draw Up NIRA Code

DETROIT—The several automotive associations in the wholesale field at a three day meeting, through the organization of a super-association have drawn up and will submit to the Industrial Recovery Administration, a code covering wages and working hours and fair trade practices.

Moto-Meter in La Crosse

LA CROSSE, WIS.—The general office and factory of the Moto-Meter Gauge and Equipment Corporation are now located in this city. The company has just started production on a new horn known as the Moto-Meter Altoaire horn. This horn is made in single models and twin sets and is finished either in black or in chromeplate.

First Six Months' Sales 678,000 Units Says Polk

An Increase of Two Per Cent Over First Half of Last Year. Truck Sales 7% Below 1932

DETROIT—Sales of new passenger automobiles in the United States in the first six months of 1933 will total approximately 678,000 units, or slightly more than 2 per cent greater than the 663,625 units sold in the first half of 1932, it was revealed today in the national weekly motor car sales report issued by R. L. Polk & Co.

New motor truck sales in the first six months of the year, however, will be almost 7 per cent below the figures for the same period of 1932. The total was estimated at 93,500 as compared with 100,564 in the first half of 1932.

The Polk estimates for the half-year were based upon complete reports of registrations of new passenger automobiles in the United States for the first five months of the year, plus a conservative estimate of 170,000 unit sales in June.

The June estimate was founded upon reports of registrations in 32 States. These showed total registrations of 101,516 units. The figure was 16.9 per cent greater than the 86,855 units registered in the same States in June last year and 12.4 per cent more than the 90,308 units registered in the same States in May this year. The estimate of 170,000 sales in June would compare with 148,752 in June, 1932, and 160,242 in May this year.

The half-year estimate of new motor truck sales was compiled by adding the estimated sale in June of 24,000 units to the complete totals for the first five months.

The June estimate was based upon complete registration reports from 31 States. These showed a total of 13,321, which was 35.3 per cent greater than the 9846 units registered in the same States in June, last year, and 16.3 per cent greater than the 11,457 units registered in those States in May this year. The June estimate of 24,000 truck sales would compare with sales of 17,876 in June last year and of 20,925 in May this year.

Motor Products Earnings Increase

DETROIT—Motor Products Corp. has reported for the quarter ended June 30, net profit of $196,333 after depreciation, taxes, and all other charges, equal to $1.03 a share, against a net loss of $147,725 in the preceding quarter and a net profit of $55,493 or 29 cents a share in the corresponding period last year. Net profit for the first six months this year totals $48,608 after all charges, equal to 25 cents a share compared with net loss of $124,033 in the first six months of 1932.

Master Appointed In W.-O. Mortgage Dispute

TOLEDO—An extended battle between bondholders and creditors over the reorganization of the Willys-Overland Co. was indicated as in early stages here today when Judge George P. Hahn, in Federal Court named George Bryce, local attorney, as special master to take evidence as to property covered by the mortgage, property not covered and property in dispute.

The appointment followed a two-day battle between counsel as to the wording of the appointment order. The creditors' group won a victory when the court allowed the creditors committee, headed by C. S. McIntyre, of the Monroe Auto Equipment Co., to be made a party defendant to the suit brought by the National City Bank of New York as trustee for a bill of foreclosure. The foreclosure suit asked appointment of receivers and it was indicated in an early hearing that all parties and the court were agreed to consolidate the suits, name the same receivers as are now serving. It developed this week, however, that the bondholders and trustee want the receivers named under their action and not a mere continuation of the original suit.

Green Bay Forge on the Up Trend

GREEN BAY, WIS.—Green Bay Drop Forge Co., specializing in automotive forgings, has been obliged to put on a night shift in order to meet delivery specifications on its contracts. The second quarter, while not up to the 1929 volume, nevertheless equalled business of 1930 and exceeded that of 1931 and 1932, according to F. J. Van Laanen, general manager.

Chain Belt Co. Recalls Workmen

MILWAUKEE — Chain Belt Co. has placed in operation its No. 2 Malleable furnace which has been idle two years, and is operating No. 1 furnace at full capacity as well, while 80 men have been recalled and working hours have been increased. Industries contributing to the increased volume are engine manufacturers, automobile and motor truck parts and equipment, brewing and malting, and washing machines.

Packard In Improved Position

DETROIT — Packard Motor Car Co. is expected to show a profit for the second quarter ended June 30. The cash position has been materially improved with cash and Government securities at the close of June totaling more than $14,000,000, compared with $12,014,973 on March 31 and $13,387,612 on Dec. 31, 1932.

WE DO OUR PART

The blue eagle will be displayed by those complying with the N.R.A. requirements

John H. Dwight

SAGINAW, MICH., July 23—John H. Dwight, who had lived in Washington since his retirement as an executive of the General Motors Corporation six years ago, died today in the hospital at Omer, Mich., to which he was taken after suffering a heart attack. He was 51 years old.

He was general manager of the Saginaw Products Company and in charge of all General Motors properties here at his retirement.

Joseph R. Armleder

CINCINNATI — Joseph R. Armleder, Sr., 72 years old, former factory manager of the Armleder Motor Company, who died July 12, retired from active business in 1928 after being associated with the company for 23 years. He was a brother of Otto Armleder, president of the truck manufacturing company.

Burkett Goes to Louisville Ford Plant

LOUISVILLE, KY.—H. J. Burkett, Houston, Tex., a member of the Ford Motor Co. organization, has been transferred to Louisville, as manager of the big assembly division here, succeeding E. L. Muehl, who goes back to the Detroit office of the company, with which he was formerly located, prior to a period in Chicago, after which he came to Louisville, where he has had charge for about a year and a half, having succeeded Peter Schwab.

The Louisville plant has been stepping up production and is employing around 1700 to 1800 men, and shipping from 260 to 275 cars a day, it now supplying a wide area in the South and some territory North of the Ohio, having assumed production requirements formerly assembled in at least four more smaller plants.

Steel Bars Will Advance Aug. 1

Flat Rolled Steel Producers Working at 70.7 Per Cent of Capacity

NEW YORK—An advance in cold finished steel bar prices before the turn of the month was accepted by most automotive buyers as a foregone conclusion early this week, and those protected by July contracts made haste to specify against their unfilled portion. Under the terms of these contracts shipments must be completed by Aug. 31. It is intimated that the advance will be approximately $5 per ton. The probability that heavy rolled descriptions of steel would be advanced before long caused quite some activity in hot rolled bars. This tended to offset a mild recession in fresh buying of sheets and strip steel. Backlogs of flat rolled steel producers, according to the returns of their national organization, had reached at the end of June 70.7 per cent of capacity, compared with 42.1 per cent at the end of May and of 22.8 per cent at the end of June, 1932. So that although new orders may come in at a more moderate pace in August and September, sheet and strip mills will be able to maintain a good rate of operations and still have a fair backlog when the confidently expected second buying movement of the year sets in later in the Fall. Non-integrated rolling mills have been taking on semi-finished steel to the full extent of their commitments in the last three or four weeks. They figured that they had nothing to lose and everything to gain by pursuing this program as prices might be marked up over night while all possibilities of decline were out of the question. There is an impression in the steel market that in the event of any unforeseen setback in the expansion program, the Government has an ace in the hold in that the letting of contracts for public works and shipbuilding can be considerably speeded up and that pressure can be brought on the railroads to enter the steel market on a much broader scale than they have done so far.

Pig Iron—Automotive foundries appear to be fairly well covered for their third quarter needs and blast furnace owners are in no hurry to open their books for fourth quarter business. Stock piles at blast furnaces are being worked lower and lower by calls against contracts.

Aluminum—Unchanged.

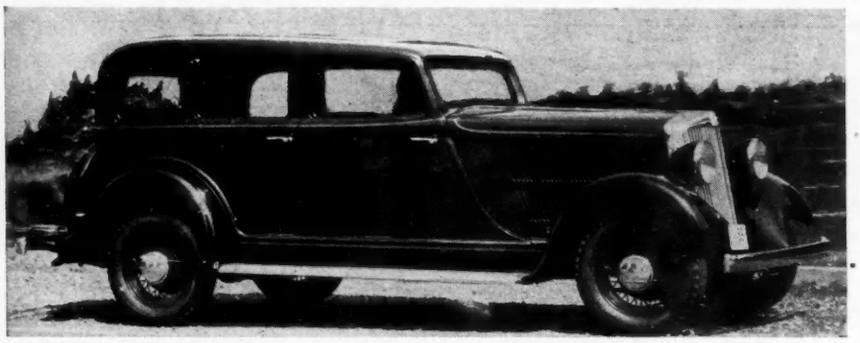
Copper—The market has recovered from the weakness brought on by the recent slump in the stock market. Small tonnages were offered by second hands then at below the 9c. level asked by producers, but this has since given way to uniform steadiness.

Tin—Firm with demand active. Straits tin opened the week at 45⅞c., with English refined, 99¾ per cent pure, offered at ¾c. below that level.

Lead—Quiet and steady.

Zinc—Prime Western was offered at 5c, East St. Louis, on Monday. Demand has turned light.

Dealers Display New Hup Six



The new car is available in three body types

DETROIT—First shipments of the new Hupmobile Standard Six are now being made to all dealer points. This new car which has all of the performance and comfort features of the regular Silver Anniversary models, is priced at $100 less, is shown here for the first time. The car is available in three body types, five-passenger sedan as shown, two passenger coupe with rumble seat and five-passenger Victoria. The chassis specifications are practically identical with the Silver Anniversary Six.

Tire Production Shows Substantial Increases

NEW YORK—Shipments of pneumatic casings for the month of May amounted to 5,180,173 casings, an increase of 41.8 per cent over April and 21.7 per cent above May, 1932, according to statistics released by The Rubber Manufacturers Asso., Inc., today.

This organization reports production of pneumatic casings for May to be 5,189,291 casings, an increase of 66.1 per cent over May and 35.8 per cent above May, 1932.

Pneumatic casings in the hands of manufacturers May 31 amounted to 6,760,165 units, practically no change as compared with April 30 stocks but was 27.9 per cent below stocks May 30, 1932.

The actual figures are as follows:

PNEUMATIC CASINGS

	Shipments	Production	Inventory
May, 1933	5,180,725	5,189,291	6,760,165
April, 1933	3,653,943	3,123,494	6,773,724
May, 1932	4,258,116	3,820,063	9,378,691

Fansteel Products Now in the Black

CHICAGO—For the year ending April 30, Fansteel Products Co., Inc., report a net income of $24,262 after expenses, depreciation, interest and other charges but before profit on bonds. This is contrasted with a net loss of $218,900 for the fiscal year before.

Council to Study Permanent Value of NIRA

WASHINGTON, D. C.—At the first meeting of the executive committee of the Business Advisory & Planning Council for the Department of Commerce was given at its first meeting to the National Industrial Recovery Act. It was decided that the Council should make a continuous study of activities and developments so that before the end of the two-year period, recommendations may be made as to what portions of the Act are of permanent value and can be retained with advantage to more closely coordinate production and consumption in the future to minimize instability of employment to as great an extent as possible.

W. C. Teagle was named chairman of the new committee which will keep in touch with the activities of individual companies and trade associations in connection with mutually protective and beneficial plans for employees. Included in these plans of thrift and savings, life and disability insurance, old age pensions, unemployment insurance, etc.

Maryland Dealers Consider Code

BALTIMORE, MD., July 27—Under the leadership of the General Automotive Dealers Association of Maryland, a meeting of the garage owners of the state will be held in Baltimore for the purpose of considering the code of fair competition. A meeting of a large number of the members and non-members who handle gasoline and oil, as well as operate garages, was held last week with Yewell W. Dillehunt, the association president, presiding. At that time, however, only the gasoline and oil code was considered, those attending approving the 40-hour week and the $15 minimum pay features.

C. B. Smith Quits Stewart-Warner Corp.

Company Cuts Loss to $847,000

CHICAGO.—C. B. Smith has announced his resignation as president of the Stewart-Warner Corporation. He also quit his position on the company's executive committee. W. J. Zucker, vice-president, retired in May.

With subsidiaries, the corporation showed a net loss of $847,000 for the six months ended on June 30, against a net loss of $1,023,000 in the first half of 1932.

Chrysler Adds to Payroll and Increases Wages

DETROIT—Walter P. Chrysler, president of Chrysler Corp., has announced a 10 per cent increase in wages, effective immediately, affecting 45,000 employees. A plan for shorter hours is being formulated and when completed will be placed in operation in the Detroit plants by July 31, according to Mr. Chrysler.

During the last year approximately 19,000 persons have been added to the Chrysler payrolls, the number of employees affected by the above increase being larger than the number employed at peak production in 1929. In January the number of employees was 30,924 and has been gradually augmented until in June it reached a total of 45,360.

Cummins Diesels for Replacements

COLUMBUS, IND.—With automotive Diesel engines of 448 and 677 cu. in. displacement now in regular production, the Cummins Engine Co. is ready to supply engines for use as replacements on trucks and buses of 2-ton capacity and upward. Replacement engines will be furnished to truck manufacturers and also to dealers who are equipped to make the installation. In addition, engines will be released to selected fleet operators of both trucks and buses for intercity use only.

Fisk Rubber Plant at Cudahy to be Sold

CUDAHY, WIS.—The entire plant of the Fisk Rubber Co. (Western Branch) Federal Rubber Co. division here will be sold at auction on Aug. 15, 16 and 17.

The plant was constructed in 1916 with additions in 1920 and 1924. Of modern construction, the buildings contain 840,000 sq. ft. of manufacturing floor space. It will be offered for sale in separate parcels affording opportunity for both large and small manufacturers.

Manufacturers' Attack Rebuilt Batteries

NEW YORK — National Battery Manufacturers' Association has issued a bulletin to battery dealers calling upon them to destroy all batteries taken in trade in order to prevent rebuilding. As pointed out by the N.B.M.A., this is a move to forestall price cutting and to maintain high standards in the battery field.

Perfect Circle Plants Going Full Speed

HAGERSTOWN, IND.—All four plants in Hagerstown, Newcastle, Tipton and Toronto are now operating at capacity due to the buying rush recently developed. The line of products on which this increase of business is being felt includes Perfect Circle piston rings, piston expanders and ring tools.

Many of the departments in the three manufacturing plants are working night shifts and the foundry at Newcastle is running 24 hours a day.

Perfect Circle sales in Canada for the first five months of 1933 were the largest in history. They showed a gain of 72 per cent over the first five months of 1932.

Maine Cops to Use Indians

SPRINGFIELD, MASS.—The Indian Motorcycle Company, through James A. Wright, sales manager, today reported the sale of 30 high speed 1934 model Indian motorcycles to the State of Maine for police use. The machines have 74 cu. in. engines and are fitted with the latest police equipment.

Canada's Business in Automotive Parts Grows

TORONTO — According to official statistics there are 73 factories in Canada which are engaged in the manufacture of automobile parts and accessories, the large majority being located in the Province of Ontario.

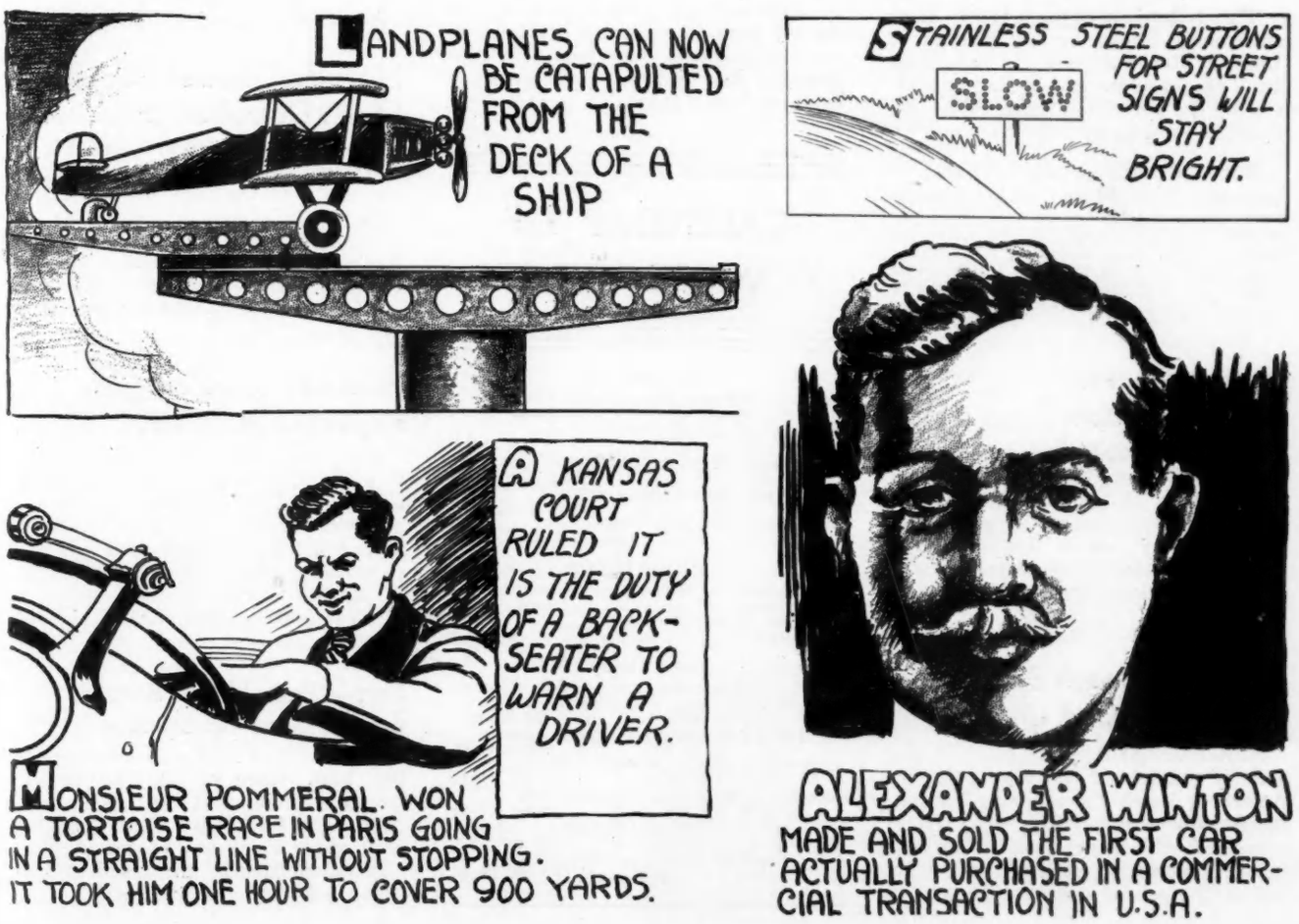
The total capitalization of the companies in this field is $14,069,973 and the average number of employees is 2833, their payroll totaling $3,019,033 in 12 months.

The figures show that the cost of materials at works during the past year was $5,343,561 while the selling value at works was $9,998,333, the value added by manufacture being $4,654,772.

The number of plants in the Dominion engaged in the manufacture of parts and accessories during 1931 was 73, the same as in 1932, but the total in 1930 was only 57.

Automotive Oddities—By Pete Keenan

Write us if you know an Oddity


LANDPLANES CAN NOW BE CATAPULTED FROM THE DECK OF A SHIP
STAINLESS STEEL BUTTONS FOR STREET SIGNS WILL STAY BRIGHT.
SLOW
A KANSAS COURT RULED IT IS THE DUTY OF A BACK-SEATER TO WARN A DRIVER.
MONSIEUR POMMERAL WON A TORTOISE RACE IN PARIS GOING IN A STRAIGHT LINE WITHOUT STOPPING. IT TOOK HIM ONE HOUR TO COVER 900 YARDS.
ALEXANDER WINTON
MADE AND SOLD THE FIRST CAR ACTUALLY PURCHASED IN A COMMERCIAL TRANSACTION IN U.S.A.

G. M. of Canada Steps Up Production

TORONTO—Increases in the original production schedule since May 5 at the plant of General Motors of Canada Limited give a total 5436 units. The latest step-up in output amounts to 500 units which was ordered on July 14. The increase represents an additional 30 per cent over the planned production.

Statistics for the Province of Ontario presented by H. A. Brown, vice-president and general manager of the corporation, covering sales during the month of June show increases over the corresponding month of last year as follows: Chevrolet, 54 per cent up; Pontiac, up 146.2 per cent; Oldsmobile, 100 per cent; Buick, 38 per cent.

For the city of Toronto alone, June increases were as follows: Chevrolet, 34 per cent; Pontiac, 164 per cent up; Oldsmobile, 166.5 per cent; Buick, 12.5 per cent.

General Motors dealers in Toronto set a high mark for used car sales during June when 950 second-hand automobiles were sold as compared with 648 during June, 1932.

Taxes for Gasoline and Lubricating Oils

The following figures taken from statements issued by the Bureau of Internal Revenue show its collections from the gasoline and other taxes affecting the petroleum industry for the first six months of 1933:

1933	Lubricating Oils	Gasoline
January	$1,320,910.92	$11,341,892.82
February	1,024,566.69	8,515,013.09
March	1,370,720.44	10,547,165.85
April	1,246,950.62	7,982,100.20
May	2,066,215.31	12,773,674.06
June	2,136,141.48	10,929,739.30
Total	$9,165,505.46	$62,089,585.32

Victor Gasket Increases Wages

CHICAGO—The Victor Manufacturing & Gasket Co. of Chicago, has announced a 10 per cent increase in wages and salaries of all employes. The company, which recently took over distribution of Armstrong cork gaskets, employs between 1000 and 1500 people.

American Bosch Earns Profit in Second Quarter

SPRINGFIELD, MASS.—For the second quarter of 1933 the United American Bosch Corp. showed a net income above deductions of $41,590 compared with a net loss of $76,504 in the preceding quarter and $164,720 in the second quarter of 1932.

G. E. Reports Increased Orders

SCHENECTADY, N. Y. — Orders to the amount of $35,539,858 were received by the General Electric Co. in the second quarter of 1933 as compared with $35,304,070 in the same period of 1932. In making this announcement Gerard Swope, president, said that this is the first time since early in 1930 that there has been an increase in any quarter over the corresponding quarter of the year before.

A dividend of $2,471,031 equivalent to 9 cents a share was made available for the common stock. The quarterly dividend of 10 cents a share is payable on July 25.

Greene Succeeds Knoble in Chrysler Advertising

DETROIT—Cliff Knoble has resigned as Director of Advertising and Sales Promotion of the Chrysler Sales Corp. that he might give his entire time to his own business. He will be succeeded by Burch E. Greene.

Better Profits for Automobile Finance Co.

NEW YORK—The net income of the Automobile Finance Company for six months ending June 30 was $20,765 against $17,595 in the same period last year. For the first half of 1933 the earnings were equivalent, after a 7 per cent preferred dividend, to one cent a share. Last year a 75 cent dividend was paid on 23,552 seven per cent preferred shares.

CALENDAR OF COMING EVENTS

SHOWS

Eastern States Exposition, Springfield, Mass. ..... Sept. 17-23
National Metal Exposition, Detroit ..... Oct. 2-6
Joint Trade Show, M.E.M.A., N.S.P.A., M.E.W.A. ..... Oct. 30-Nov. 4
New York Automobile Show, Jan. 6-13, 1934
Chicago Automobile Show Jan. 27-Feb. 3, 1934

CONVENTIONS

Natl. Assoc. of Motor Bus Operators, Chicago ..... Sept. 21-22
National Metal Congress, Detroit ..... Oct. 2-6

MEETINGS

S.A.E. International Automotive Engineering Congress, Chicago Aug. 28-Sept. 4
American Chemical Society, Chicago Sept. 11-15
American Transit Assoc., Chicago Sept. 18-20
National Petroleum Assn., Annual, Atlantic City ..... Sept. 20-22
Natl. Safety Council, Chicago.... Oct. 2-6
National Metal Congress, Detroit. Oct. 2-6
American Petroleum Institute, Annual, Chicago ..... Oct. 24-26

Motor Bus Operators Draw Fair Practice Code

WASHINGTON, D. C.—John M. Meighan, secretary-manager of the National Association of Motor Bus Operators has given out the code of fair competition for the motor bus industry as drafted by the special committee appointed by President Hill. According to the action of the Board of Directors a meeting of the Association will be held in Washington on July 31. Every passenger-motor bus carrier of record is urged to have a representative in attendance.

After the preliminary decaration of policy, statement of definition and terms, the code sets up a minimum wage to be paid by all employers in the industry except porters, cleaners, apprentice mechanics, apprentice drivers and the casual or part time employees of $15 per week.

The code further stipulates that in the motor bus industry employers shall not operate on a schedule of hours of labor for their employees except supervisory employees, porters, watchmen, baggage checkers and janitors on an average for the year of more than 54 hours per week.

Other provisions of the code cover licensees, reports, tariffs, bonds or insurance, motor carrier transportation agent, ticket sales commission, free transportation, general traffic regulations, for the right of employees to organize and bargain collectively and other details of minor importance.

Now Its Colonel Chrysler, Other Detroiters Honored

LOUISVILLE, KY. — Walter P. Chrysler, president and chairman of the board of the Chrysler Corp., has been commissioned a colonel on the staff of Governor Ruby Laffoon of Kentucky. Other Detroiters who received similar commissions are Fred L. Zeder, O. R. Skelton, Carl Breer and John J. Oaton.

Ford Motor of Sweden Reports Loss in 1932

STOCKHOLM—Ford Motor Co. A. B. of Sweden (controlled by Ford Motor Co., Ltd., of England) reports a net loss for 1932 of 1,029,769 kroner after trading profit and other incomes. Contrasted with this is a net income of 238,065 kroner for 1931, equal to 4.76 per cent on 5,000,000 kroner capital stock.

Bert Wilcox Heads Booster Employment Committee

PHILADELPHIA — Announcement has been made by the Automotive Boosters Clubs that Bert Wilcox, 75 Spring Street, New York City, has been made chairman of the employment committee by the board of governors of that organization.